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MONTHLY NOTICES

OF THE

ROYAL ASTRONOMICAL SOCIETY.

VOL. LIII. No. 6. APRIL 1893.

Fellows of the Society are informed that post-cards containing the titles of papers to be read at the evening meetings will be sent to those who shall express their wish to receive them. Fellows desiring to receive the post-cards are requested to send their names to the Assistant-Secretary, Mr. W. H. Wesley, Burlington House, London, W.

In order to enable the Secretaries to prepare complete lists in time for the issue of the post-cards, authors are particularly requested to send in their papers not later than the Tuesday preceding the day of meeting.

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VOL. LIII. APRIL 14, 1893. No. 6

Captain W. DE W. ABNEY, C.B., R.E., D.C.L., F.R.S., President, in the Chair.

Ludwig Becker, Ph.D., Professor of Astronomy and Director of the Observatory in the University of Glasgow;
Bernard Edward Cammell, Folly Court, Wokingham, Berks;
Raymond Hill Godfrey, F.R.G.S., 79 Cornhill, E.C., and Firview, Claygate, near Esher, Surrey;
Samuel Marcus Russell, Professor of Mathematics and Astronomy, Imperial College, Pekin, China,

were balloted for and duly elected Fellows of the Society.

The following candidates were proposed for election as Fellows of the Society, the names of the proposers, from personal knowledge, being appended:—

Hedley Robert Beasley, Head Master of the Milldown School, Blandford, Dorset (proposed by Thomas Perkins);
Edwin Bailey Elliott, M.A., F.R.S., Waynfleete Professor of Pure Mathematics in the University of Oxford (proposed by E. J. Stone);
Walter Frederick Gale, M.R.S. of New South Wales, The Observatory, Paddington, New South Wales, Australia (proposed by H. C. Russell);
Arthur E. Kennelly, Edison's Laboratory, Orange, New Jersey, U.S.A. (proposed by D. J. Kennelly);
Arthur A. Rambaut, D.Sc., Royal Astronomer of Ireland, The Observatory, Dunsink, co. Dublin (proposed by Sir R. S. Ball);
Frederick Lumb Wanklyn, Grand Trunk Railway Company, Montreal, Canada (proposed by D. J. Kennelly).

Eighty-two presents were announced as having been received since the last meeting, including, amongst others :—

Agnes Giberne, Sun, Moon, and Stars (new edition), presented by the author ; Lick Observatory publications, No. 3 ; G. Leveau, Théorie du mouvement de Vesta, presented by the author ; J. M. Schaeberle, Terrestrial atmospheric absorption of photographic rays of light, presented by the Observatory ; Original negatives of *Jupiter*, and photographs from drawings of *Mars*, presented by the Lick Observatory.

Reproduction of Photographs.

Arrangements have been made with Messrs. Eyre & Spottiswoode by which Fellows, and the public at large, will be able to obtain reproductions of photographs in the possession of the Society by purchase. Messrs. Eyre & Spottiswoode will copy such photographs, in every case providing one copy for the Society free of cost, and will sell copies to the Fellows or those who apply for them, at a fair price. It is to be understood that this firm has not been granted any exclusive right over the reproduction of photographs, and that the present arrangements are terminable at the pleasure of the Council.

The Council resolved, on 1893 April 14, that notice should be given to the Fellows of these arrangements by a paragraph in the *Monthly Notices*.

E. W. MAUNDER,
H. H. TURNER,
Secretaries.

On the Parallactic Inequality in the Earth's Motion around the Sun. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

I take for the variations of the geocentric coordinates of the Sun due to a shift of origin from the common centre of gravity of the Earth and Moon to the centre of gravity of the Earth the expressions given by Le Verrier, *Solar Tables*, p. 47 :

$$dr = -\frac{m'}{m+m'} \cdot r' \cos s' \cdot \cos(\nu' - \nu).$$

$$\delta s = -\frac{m'}{m+m'} \frac{r'}{r} \cdot \sin s'.$$

$$dr = -\frac{m'}{m+m'} \frac{r'}{r} \cdot \cos s' \cdot \sin(\nu' - \nu).$$

where r' ν' s' are the geocentric coordinates of the Moon ; r ν the heliocentric coordinates of the Earth ; m' m the masses of the Moon and Sun. Putting $\nu = \odot + 180$, the expressions for $\odot$ and r are taken from Le Verrier's *Solar Tables*, pp. 52, 53, 54.

The coordinates of the Moon, V, U$=s'$ and P, are taken from Delaunay's numerical results, *Conn. des Temps*, 1869. I put

$$\frac{m'}{m+m'}=\mu\,;\ \sin 1''\frac{a}{1}=\Pi\,;\ \sin 1''\frac{a}{r'}=\frac{\mathrm{P}}{3422''\cdot7}\times\mathrm{C},$$

where a is the equatoreal radius of the Earth; π and C are the exact values of the constants of the Solar and Lunar Parallax; and $3422''\cdot7$ is the constant of lunar parallax adopted by Delaunay.

I then simply develop the expression

$$\frac{1}{r}\cdot\frac{3422''\cdot7}{\mathrm{P}}\cos s',$$

which I find equals

$$\begin{aligned}0\cdot999547\,[1&-0\cdot0546\cos l-0\cdot0015\cos 2l\,.\,+0\cdot0020\cos 2\mathrm{F}\\&-0\cdot0076\cos 2\mathrm{D}-0\cdot0096\cos(2\mathrm{D}-l).\\&-0\cdot0004\,.\,\cos(2\mathrm{D}+l)+0\cdot0169\,.\,\cos l'+\&\mathrm{c.}]\end{aligned}$$

Denoting $\nu'-\odot=\mathrm{V}-\odot$ by A, and expressing $d\nu$ in seconds of arc, we have

$$\sin 1''d\nu''=\frac{\mu\,.\,\Pi}{\mathrm{C}}\times0\cdot999547\,[1-0\cdot0546\cos l-\&\mathrm{c.}]\sin\mathrm{A}.$$

If, therefore, we find from a discussion of observations that the coefficient of sin A is an angle α'', we have

$$\alpha''=\frac{\mu\,\Pi}{\mathrm{C}\sin 1''}0\cdot999547,$$

and therefore, if we adopt for C the value $3422''\cdot7$, a value which appears to be one of considerable accuracy, we have

$$\Pi=\frac{\alpha''}{\mu}\,.\,\frac{\mathrm{C}\sin 1''}{0\cdot999547}=\frac{\alpha''}{\mu}\times0\cdot016601.$$

The factor 0·016601 agrees very closely indeed with Le Verrier's value 0·01662, which I verified and adopted in 1867 to deduce the value of the solar parallax from the angle $\alpha''=6''\cdot50$, a value which was found by Le Verrier from a discussion of observations of the Sun between 1804 and 1850, made at Greenwich, Paris, and Königsberg.

Some doubts have been expressed about the use by Le Verrier of the argument A$=\mathrm{V}-\odot$ for the determination of the angle $6''\cdot50$. But Le Verrier states most clearly, on pages 47 and 48 of his *Solar Tables*, that r', ν', s', r, ν are the coordinates at the time; and he actually works out an example of the use of his formulæ for 1847 April 8, mean noon, in which the true longitudes and not the mean longitudes are carefully used.

He employs for the determination of the solar parallax the factor which would be the correct factor if his coefficient was determined strictly in accordance with his formula; and after

he has obtained the coefficient 6·50 he tabulates it for his *Solar Tables*, from an expression which is sensibly the same as that which I have found. (See pages 108, 109).

$$dv'' = 6''{\cdot}50 \sin A - 6''{\cdot}50[0{\cdot}0546 \cdot \cos l + 0{\cdot}015 \cos 2l$$
$$+ 0.0076 \cos 2D + 0{\cdot}0096 \cos (2D - l) + \&c.] \sin A$$
$$+ 6''{\cdot}50 \sin A \times 0{\cdot}0169 \cos l' + 6''{\cdot}50 \cdot \sin A \cdot \cos 2F^*$$

and in tabulating the results for his *Solar Tables* Le Verrier most carefully allows for the difference between $A = V - \odot$ and D, or for the difference between the true and mean longitudes of the Moon and Sun.

It is incredible to me that Le Verrier should have taken all the necessary precautions in working out an example of the use of the formulæ and in tabulating the results; should have selected a factor which is the proper one when the true longitudes are used and for cos s' the mean value 0·99867 is substituted; and yet should have neglected the precautions necessary to obtain an accurate value of the angle from a discussion of such an extended series of observations as that employed for the direct object of a determination of the value of the solar parallax.

I have also developed the expression for sin A, and have thus been led to the expression

$$dv = \frac{\mu\pi}{\sin 1'' \cdot C} 1{\cdot}004451 \left[\begin{array}{l} \sin D + 0{\cdot}0024 \sin 3D \\ -0{\cdot}0662 \sin (D - l) + 0{\cdot}0278 \sin (D + l) \\ +0{\cdot}0060 \sin (3D - l) \\ +0{\cdot}0272 \sin (D - l') \\ -0{\cdot}0101 \sin (D + l') \\ +0{\cdot}0021 \sin (D - 2F). \end{array}\right]$$

In this case, if β is the angle found from a discussion of observations as the coefficient of sin D, we shall have

$$\pi = \frac{\beta}{\mu} \cdot \frac{C \sin 1''}{1{\cdot}004451};$$

or, adopting as before, C = 3422·7, we have

$$\pi = \frac{\beta}{\mu} \times 0{\cdot}01652,$$

a result which agrees very closely indeed with that which Professor Newcomb has obtained when β is supposed to be the coefficient of the term sin D.

My result, however, differs from that obtained by Professor Newcomb with respect to the term $+0{\cdot}0021 \sin (D - 2F)$, in the place of which Professor Newcomb has a term $-0{\cdot}0020 \sin 2F$. I will, however, re-examine my work on this point; but I believe it to be correct.

* This term is not included in Le Verrier's expression.

It need hardly be pointed out that the angles α and β are not identical; and that the use of the factor 0·01652 with the angle α or the factor 0·01660 with the angle β will lead to sensibly erroneous values in the solar parallax.

The coefficients α or β will not however be obtained with accuracy from observations extending over periods of only two or three lunations, unless the periodical inequalities are accurately computed for the times of observation. The use of tabular places of the Sun, computed for intervals of a few days and then interpolated for the time of observation, will not in such cases be sufficient to secure accuracy.

The Secular Perturbations of the Earth arising from the Action of Venus. By R. T. A. Innes.

Although the eccentricities of the Earth and *Venus* are very small, the perturbing function is but slowly convergent on account of the high ratio of their mean distances.

Thus if the secular portion of the perturbing function be represented by

$$M e^h e^h n^f \cos A,$$

as in Le Verrier (*Annales*, tome ii. p. 89), the largest coefficient M is in the case of

Second power =	3·2	Le Verrier
Fourth power =	96·9	
Sixth power =	4710·0	

I therefore undertook the computation of the secular terms by Gauss's method, as laid down by Professor Hill. The elements used are found in Hill's "Jupiter and Saturn." The mass of *Venus* is assumed $\frac{1}{408134}$, and I get the following results. For comparison I add the figures found by Le Verrier and Hill by algebraical expansion, reducing all results to the above mass.

		Le V.	Hill.
	"	"	"
$\frac{de}{dt}$ =	+ 0·013156	+ 0·013440	
$e\frac{d\varpi}{dt}$ =	+ 0·057915	+ 0·057963	
$\frac{dp}{dt}$ =	+ 0·074459	+ 0·074504	+ 0·074433
$\frac{dq}{dt}$ =	− 0·284623	− 0·284538	− 0·284528
$\frac{dl}{dt}$ =	+ 11·232490	+ 11·229806	

So that my computation may be verified or corrected, I give the most important figures involved:—

$$K = 330\ 56'\ 48''.79 \qquad \log k = 9.9994999$$
$$K_1 = 330\ 51'\ 5''.11 \qquad \log k_1 = 9.9997387$$

Dividing the circumference into 12 parts, the sums of functions for 0°, 60°, 120°, 180°, 240°, 300°, and 30°, 90°, 150°, 210°, 270°, 330°, are equal to each other, and for A, B, and $\frac{r^2}{a^2}$, they are as follows:—

$$\frac{r^2}{a^2} = 6 + 3e^2 \qquad \frac{A}{a^2} = 6 + 3e^2 + 6\left[\left(\frac{a_1}{a}\right)^2 - 2k\left(\frac{a_1}{a}\right)ee_1 \cos K\right]$$

$$\frac{B\cos\epsilon}{a^2} = 6\left[\left(\frac{a_1}{a}\right)^2 e_1 - ke\frac{a_1}{a}\cos K\right] \qquad \frac{B\sin\epsilon}{a^2} = -6\left[k_1\left(\frac{a_1}{a}\right)\cos\phi_1 e\sin K_1\right]$$

These tests were satisfied.

From a manuscript table I took the values of

$$M = \frac{\sin\left(60° - \frac{\theta}{3}\right) - v_1}{\frac{3}{2}\sqrt{12}} \text{ and } N = \frac{\frac{1}{2} + m^2 n^2 - v_1 \sin\theta}{\sin\left(60° - \frac{\theta}{3}\right) - v_1}$$

To make these equal to Hill's functions, $\chi(r)$ and $\psi(r)$, it is necessary to multiply each by

$$\left[\frac{\cos\left(60 - \frac{\theta}{3}\right)}{\cos\theta}\right]^2$$

and N by M in addition. Instead of Hill's F, I computed Fq. In F_3 and J_3, I removed the common factor sin I, and in

$$\frac{a}{r}R \text{ \&c.}$$

the common factor

$$\left(\frac{a_1}{a}\right)^2 \cos^2\phi_1$$

to the end of the calculation, so that I could write

$$\frac{a}{r}R_0 = \left(\frac{r}{a}\right)\left(\frac{q}{a^2}\right)^{-\frac{7}{2}} M\left[\frac{\cos\left(60 - \frac{\theta}{3}\right)}{\cos\theta}\right]^2 \{F_1 + J_1(p + qN)\}.$$

These changes are very simple, thus:—

$$\left[\frac{dp}{dt}\right]_{00} = \frac{m_1 n}{1+m}\left(\frac{a_1}{a}\right)^2 \cos^2\phi_1 \sin I\,[(\tfrac{1}{2}C_1^{(c)} - \sin\phi\, C_0^{(c)})\sec\phi \sin w + \tfrac{1}{2}C_1^{(s)}\cos w].$$

The portion of the table used for *Venus* and the Earth to find M and N is as follows :—

θ	Log M	θ	Log N
°		°	
1	9·5237699	1	0·1005869
2	9·5229823	2	0·0995895
3	9·5221837	3	0·0985821
4	9·5213742	4	0·0975647
5	9·5205536	5	0·0965374
6	9·5197219	6	0·0954999
7	9·5188789	7	0·0944526
8	9·5180245	8	0·0933955

I then have

	p		q^2	
1	0·4994744	0·5013630	0·0795055	0·0807033
2	0·5049397	0·5092804	826279	846595
3	0·5132391	0·5157380	863402	874101
4	0·5160732	0·5141376	876857	870065
5	0·5104671	0·5060796	853658	830996
6	0·5021677	0·4997626	809004	795465
S	3·0463612	3·0463612	0·5024255	0·5024255

	r		θ	
			° ′ ″	° ′ ″
1	0·0027381	0·0023201	+7 0 56·27	5 48 28·91
2	17893	13770	4 19 13·91	3 12 16·27
3	11341	9732	2 33 43·22	2 9 29·48
4	8465	8529	1 52 5·60	1 54 16·48
5	11449	17300	2 37 51·43	4 8 28·74
6	23844	27841	5 56 51·88	7 7 42·62
S	0·0100373	0·0100373	24 20 42·31	24 20 42·50

	F_1		F_2	
1	0 3248737	0·3261975	+0·0023649	−0·0001134
2	0·3293982	0·3339299	−0·0025722	−0·0043526
3	0·3384543	0·3413239	−0·0049775	−0·0042795
4	0·3414583	0·3389450	−0·0024456	+0·0000327
5	0·3348929	0·3306994	+0·0024915	+0·0042719
6	0·3273643	0·3253460	+0·0048968	+0·0041988
S	1·9964417	1·9964417	−0·0002421	−0·0002421

	F_2		Log J_1	
1	+0·0021106	−0·0000634	*n*9·9590356	*n*9·9632968
2	−0·0001842	+0·0019107	*n*9·9702253	*n*9·9775761
3	+0·0041615	+0·0043359	*n*9·9836640	*n*9·9874669
4	+0·0022571	−0·0000193	*n*9·9883095	*n*9·9857584
5	−0·0002543	+0·0017453	*n*9·9799346	*n*9·9719857
6	+0·00139449	+0·0041263	*n*9·9641916	*n*9·9592765
S	−0·0120356	+0·0120355	9·8453606	9·8453604

	J_2		J_3	
1	−0·00585505	−0·00140226	+0·40785020	+0·80341952
2	+0·00468370	+0·00971660	+0·97976102	+0·88962359
3	+0·01115191	+0·00845479	+0·55715872	+0·07145088
4	+0·00332326	−0·00173361	−0·43735442	−0·83292266
5	−0·00513377	−0·00687857	−1·00926200	−0·91912349
6	−0·00770880	−0·00769584	−0·58665970	−0·10095402
S	+0·00046125	+0·00046111	−0·08850618	−0·08850618

	Log $\{p \times q\,N\}$		Log $\left(\frac{r}{a}\right)\left(\frac{q}{a^2}\right)^{-\frac{7}{2}} M \left(\frac{\cos\left(60-\frac{\theta}{3}\right)}{\cos\theta}\right)^2$	
1	9·9293839	9·9322094	0·8989321	0·8778041
2	9·9367767	9·9416173	0·8496439	0·8253422
3	9·9456301	9·9481456	0·8086417	0·7985623
4	9·9487182	9·9470473	0·7947352	0·7999840
5	9·9432020	9·9379393	0·8178429	0·8474369
6	9·9327766	9·9295283	0·8798797	0·9005482
S	9·6364875	9·6364872	5·0496755	5·0496777

	$\frac{a}{r}R_0$		$\frac{a}{r}S_0$	
1	−3·5542377	−3·4715104	−0·0206925	−0·0099099
2	−3·3800798	−3·3195412	+0·0104478	+0·0277033
3	−3·2909303	−3·2757000	+0·0312943	+0·0202729
4	−3·2636662	−3·2664060	+0·0031635	−0·0094760
5	−3·3061634	−3·3921547	−0·0132332	−0·0118988
6	−3·4993960	−3·5691123	−0·0129415	−0·0186450
S	−20·2944734	−20·2944246	−0·0019616	−0·0019535

	$\frac{a}{r}W_0$	
1	+2·7634580	+5·1869928
2	+5·9902685	+5·2147250
3	+3·1908882	+0·4260306
4	−2·4085589	−4·6520828
5	−5·8233581	−5·5949679
6	−3·7811149	−0·6498359
S	−0·0684172	−0·0691382

The discordance in

$$\frac{a}{r} W_\theta$$

is large, but I cannot account for it. Lastly

$$A_0^{(c)} = -3{\cdot}3824082 \qquad B_0^{(c)} = -0{\cdot}0003263$$
$$\tfrac{1}{2} A_1^{(c)} = -0{\cdot}0719575 \qquad \tfrac{1}{2} B_1^{(c)} = -0{\cdot}0057844$$
$$\tfrac{1}{2} A_1^{(s)} = +0{\cdot}0194409 \qquad \tfrac{1}{2} B_1^{(s)} = +0{\cdot}0098052$$
$$\tfrac{1}{2} A_2^{(c)} = -0{\cdot}0132740 \qquad \tfrac{1}{2} B_2^{(c)} = -0{\cdot}0041664$$
$$\tfrac{1}{2} B_2^{(s)} = -0{\cdot}0030421$$
$$C_0^{(c)} = -0{\cdot}0114629$$
$$\tfrac{1}{2} C_1^{(c)} = +1{\cdot}2651658$$
$$\tfrac{1}{2} C_1^{(s)} = +2{\cdot}7113348$$

S and S_1 for $\frac{1}{2} C_1^{(c)}$ are respectively

$$+7{\cdot}5928286 \text{ and } +7{\cdot}5891614,$$

and for $\frac{1}{2} C_1^{(s)}$

$$+16{\cdot}268854 \text{ and } +16{\cdot}2671640.$$

The equation

$$\sin \phi \tfrac{1}{2} A_1^{(s)} + \cos \phi B_0^{(c)} = 0$$

I find equal to

$$-0{\cdot}00000016.$$

The epoch is 1850·0

Sydney, N.S.W.:
1892 *November* 4.

Photograph of the Cluster M 34 *Persei.*

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the cluster M 34 *Persei* R.A. $2^h\ 35^m$ Decl. north 42° 20′ was taken on 1892 December 26, with an exposure of the plate during sixty minutes. It is No. 584 in the *General Catalogue*, and is described by Sir J. Herschel as bright, very large, little compressed, scattered stars, 9th mag.

The Earl of Rosse, in his *Observations of Nebulæ and Clusters of Stars*, p. 31, describes the cluster as large, bright, scattered cluster. An isosceles triangle of stars on the north side points south to a red star which has a small companion *s. p.*

The photograph confirms the general descriptions, and presents to the eye the component stars in the cluster in their true relative positions and magnitudes for future reference. Several of the stars in and around the cluster have faint stars like

comites near them, and the photograph shows the stars down to 14th or 15th mag.

Neither Herschel nor Rosse has published drawings of the cluster, and the value of the photograph will chiefly be in the future, when other photographs have been taken and correlated with it.

Photograph of the Nebula H II 240 *Pegasi.*
By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebula H II 240 *Pegasi*, an enlargement of which to the scale of 15 seconds of arc to one millimetre is now presented, was taken on 1891 December 2, with an exposure of the plate during 2 hours and 36 minutes. The nebula is No. 5,046 in the *General Catalogue*, R.A. $23^h\ 58^m$, Decl. 15° 33′ north. It is figured in the *Phil. Trans.* 1861, pl. 30, fig. 42, p. 736, where the Earl of Rosse describes it as bright, pretty large, elongated, gradually much brighter in the middle; and in his *Observations of Nebulæ and Clusters of Stars* 1855 to 1860, p. 177, pl. 5, he gives another drawing of the nebula, and states that a decided dark lane runs through it, in the direction of its major axis. This feature is also shown on both the drawings which have been referred to.

Sir John Herschel, in his *Observations of Nebulæ and Clusters of Stars*, p. 481, describes the nebula as bright, large, irregularly round, 2′ or 3′ diameter, no nucleus, but he does not refer to the dark lane or to the surrounding nebulosity.

The photograph very fully confirms the observations, and the drawings made by the Earl of Rosse, excepting the widening out of the faint nebulosity at each extremity of the major axis, which the photograph does not show. The dark lane is conspicuously visible, and it divides the major axis into two equal parts. The central part of the nebula is a globular mass, and measures 41 seconds of arc in diameter, but it differs from a star in not having a central inner condensation or nucleus. The dark lane measures about eight seconds of arc in breadth, which is uniformly maintained as far as it can be traced on the photograph, except at the place where it crosses the denser part of the globular mass. There it is narrower, and less distinctly visible.

The inferences that I draw from the photograph are, that the dark lane is a ring, seen edgewise, surrounding the globular mass, and that there is another very wide, nebulous, faint ring surrounding the central mass, between it and the dark outer ring. The outer ring intercepts the light of the inner nebulous ring, and where it crosses the luminous central condensation the light is intercepted in a lesser degree, in the manner seen when the ring of *Saturn* is viewed nearly edgewise across the planet.

Telescope Objectives for Photographic Purposes.

By H. Dennis Taylor.

The larger number of telescopes for mapping and surveying the heavens by means of photography have already been made, and it may be assumed that the best form of objective to satisfy the requirements has been ascertained in practice, at any rate approximately. Nevertheless, I think that the remarks which I have to offer will certainly be of interest to those numerous members of this Society who have more or less devoted their mathematical bent of mind to the kindred science of optics, with the theoretical and practical advancement of which the science of astronomy is very closely concerned.

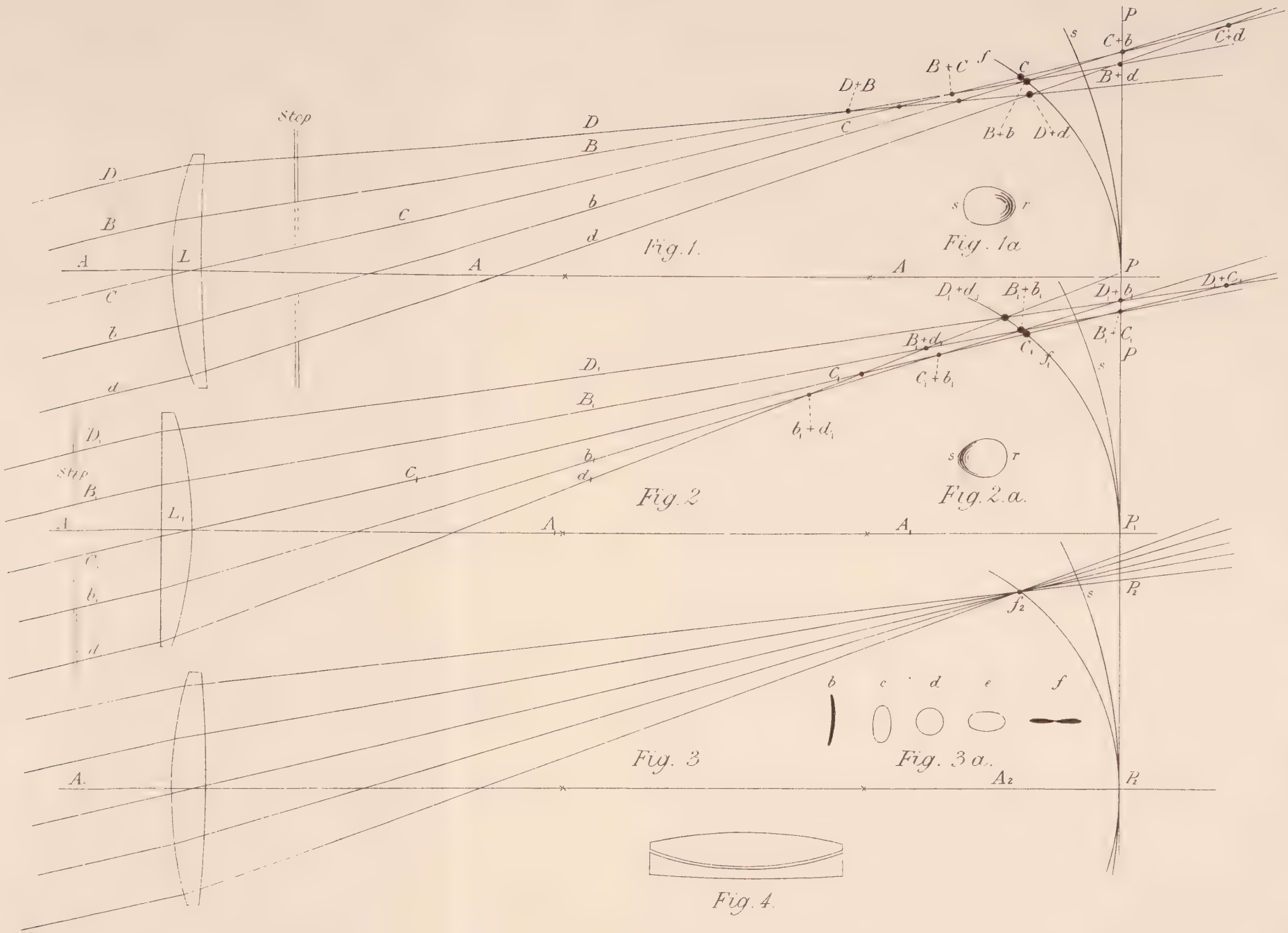
It was wisely decided at the Paris Convention that the standard objective for celestial photography should be so corrected as to have its minimum, or most intense focus for the G ray, to which the ordinary rapid bromide plate is most sensitive. This, together with the focal length and aperture, was about all which the Convention prescribed. It did not seem to be widely enough recognised that the *form* of the objective would have a *great deal* to do with its efficiency as regards the size of field yielded by it. Dr. Steinheil, however, conscious of the importance of the *form*, made two recommendations, which were accepted by the Convention, and which ran to this effect:—The ratio between the sine of the angle of incidence on the first surface for a ray parallel to the axis, but striking the edge of the objective, and the sine of its angle of emergence at the fourth surface, must be equal to the ratio between the sines of angles of incidence at first surface and emergence at fourth surface for another ray, also parallel to the axis, but striking the objective at a point much nearer its centre. This is the condition under which the objective will give the best possible lateral image. Also, a white ray parallel to the axis, but striking the edge of the O. G, must not only have those coloured constituents which the O. G is supposed to refract to the same focus, emerge at the fourth surface in such a manner as to proceed to the same focus, but they must also emerge *at the same point* at the fourth surface; this is the condition that the images in both colours shall be of the same size.—For my part, I confess that I do not grasp the necessary relation between Dr. Steinheil's two conditions and the two advantages respectively aimed at, although I find that the first condition certainly does hold good in an objective corrected for the largest possible field. But, granting the relations to be correct, it cannot be said that Dr. Steinheil's conditions would facilitate a direct calculation of the curves, &c., necessary to fulfil the third and fourth of the several conditions following, the first three being indispensable and the last two very desirable:—

1. The proper colour correction.
2. Freedom from spherical aberration.
3. The largest possible field of fair definition (Dr. Steinheil's first condition).
4. The images in different colours to be of the same size (Dr Steinheil's second condition).
5. Freedom from distortion; all great circles on the celestial sphere should be represented as straight lines on the sensitive plate.

I here propose to deal more especially with the fulfilment of the third condition, although I may venture a few remarks upon the others. As to the calculation of the objective for the minimum focal length for rays of any given wave length, if nicety is required in the matter, then the only method available for a direct result is to express the focal length of the whole objective in terms of the wave length by an adaptation of Cauchy's dispersion formula, somewhat after the method of Professor Harkness (in *American Journal of Science and Arts*, vol. xviii., 1879 Sept.), differentiating the focal length, thus expressed, with respect to the wave length, and equating the differential coefficient to 0; the resulting equation will then determine the relation between $\frac{1}{\rho_1}$ for the crown lens and $\frac{1}{\rho_2}$ for the flint lens, these symbols, as usual, representing the sums of the reciprocals of the radii for the crown and flint respectively. Or the relations between $\frac{1}{\rho_1}$ and $\frac{1}{\rho_2}$ may be calculated for proper colour correction with tolerably near approximation by the ordinary methods, such, for instance, as conditioning that the rays F and G shall be brought to the same focus, trusting to a subsequent slight modification of one of the surfaces for neutralising the slight over-correction which would follow.

But, assuming that the relations between $\frac{1}{\rho_1}$ and $\frac{1}{\rho_2}$ are very approximately known, we have next to consider what conditions are necessary to secure the largest possible field of view. Objectives can and do vary enormously in this respect. I could show you an objective of $4\frac{1}{2}$ inches aperture, with a convexo-concave crown, which yields an image which falls off so rapidly on leaving the optic axis, that even when using a Huygenian eyepiece of rather a high power, the bad definition towards the edge of the visual field is most striking. And, as necessarily follows, such an objective is keenly sensitive to the slightest tilt; if it is thrown "out of square" to even the slightest degree, good definition is quite destroyed.

The degree to which this imperfection is present is not a matter of curvature of the image, for it can be demonstrated that all objectives, of whatever form, yield images whose degree of curvature varies only between very narrow limits indeed, accord-


Stop
D
B
C
b
d
A
L
P
s
C+b
C+d
B+C
f
C
D+B
B+d
B+b
D+d
Fig. 1.
s
r
Fig. 1a
D1+d1
B1+b1
D1+b1
D1+C1
B1+d1
C1
f1
C1+b1
b1+d1
D1
B1
b1
d1
C1
Stop
L1
A1
P1
Fig. 2
Fig. 2.a.
P2
f2
b
c
d
e
f
Fig. 3
Fig. 3 a.
A2
Fig. 4.

ing to the sorts of glasses employed, as I shall presently show; nor is it a matter of astigmatism either, for it can be shown that the amount of marginal astigmatism (for a standard degree of obliquity) is a constant quantity for a given focal length, and totally independent of either the curves or the sorts of glasses employed.

It may be stated broadly that the characteristic of the objective which determines whether its field of fair definition shall be small and confined to a few minutes of arc only, or extended to two degrees square or so, as required in the photographic telescope, is the degree in which it is free from the defect of "coma," or what may also be called eccentric or *unsymmetrical oblique refraction*. In Plate 7, fig. 1, L represents an achromatic and aplanatic lens, by which the oblique parallel rays (from a star) D, B, C, *b*, and *d* are refracted to a focus at *f*. Let it be supposed that the curves of L are bulged outwards somewhat towards the left, then the form of the focus at *f* will be very peculiar. Let C be that ray which passes approximately through the centre of the objective and meets with no deviation. Let B and *b* be a pair of rays at equal distances on each side of C, and D and *d* another pair of rays also symmetrical with respect to C, but still wider apart, edge rays in fact. Confining our attention to rays in primary planes (the plane of the paper being the principal primary plane), it can be shown that any pairs of rays, such as B and *b*, D and *d*, situated at equal distances from, but on opposite sides of C, come to a focus upon the primary focal curve P - - *f*, but while the ultimate focus for rays close about C is at the point C on the curve P - - *f*, the rays B and *b* focus at a point B + *b*, which is displaced laterally towards the optic axis; while the extreme pair of rays D and *d* focus at the point D + *d*, which is displaced towards the optic axis by a still larger amount. The ordinates of the curve P - - *f*, measured from the axis P - - P (the principal focal plane), are represented by

$$-\mathrm{F}\,\frac{\tan^2\phi}{2}\left(\frac{3\mu+1}{\mu}\right)$$

where F is the principal focal length, ϕ is the angle of obliquity, and μ is (for shortness) a sort of mean between the indices of refraction for the two or more lenses of which the O.G is composed. The curve P - - *f* may be described approximately as a circle tangent to P–P, and of a radius equal to

$$\mathrm{F}\,\frac{\mu}{3\mu+1}.$$

Thus the radius of this curve, P - - *f* will be found to be generally about $\frac{3}{11}$ of the focal length, while in secondary planes the focal curve is of a radius equal to

$$\mathrm{F}\,\frac{\mu}{\mu+1},$$

or generally about $\frac{3}{5}$ of the focal length. The mean between these values or

$$F \frac{\mu}{2\mu + 1},$$

therefore represents the radius of curvature of the curve or locus *of circles of least confusion*, or the curve along which the most distinct image is formed. Thus the most distinct image is formed on a curve having a radius of curvature of $\frac{3}{5}$ of the focal length, generally speaking.

Returning again to the lateral displacement along the primary focal curve P - - *f*, to which the foci of the symmetrical pairs of rays B and *b*, D and *d*, are subject, it will be seen readily from fig. 1 that the consequence of this peculiar arrangement is that the foci for any *eccentric* pairs of rays, such as D and B, *b* and *d*, B and C, C and *d*, &c., are thrown altogether off the focal curve P - - *f*. The pair D and B focus at the point D + B, far short of the curve P - - *f*, while such an eccentric pair of rays as *b* and *d*, lying on the other side of C, have their focus or point of intersection quite beyond the curve P - - *f*, at a point (beyond the edge of the diagram) which may be actually beyond the principal focal plane P - - P. I have marked most of the intersection points for any two rays by corresponding couples of letters. Of course the diagram is exaggerated for the sake of clearness.

The effect of placing a circular aperture or diaphragm *behind* the lens L becomes evident on inspection. If it is placed as shown in fig. 1, then only the *eccentric* pair of rays C and *b* are allowed to pass, and these intersect or have their focus at the point C + *b*, just about on the principal focal plane P - - P; thus the diaphragm or stop *may* render the field of view perfectly flat for rays in primary planes. But if the stop were placed in front of L, it is evident that the effect would be to render the image more curved than before.

Now, if a piece of ground glass is placed across the focus at *f*, it will be found, if the source of light is bright enough, that there is no distinct image such as a point, line, or circle of light, but a curious balloon-shaped penumbra (sometimes called a "coma," if not too violent), which I have endeavoured to represent in fig. 1 *a*. *r* is the smaller and brighter end, and is where the most intense concentration of rays occurs, it being the place about which the ultimate centre ray and those close about it focus at C. The larger end, *s*, is much less bright and more diffused, and corresponds to where the more extreme rays, such as D and *d*, come to focus.

Thus in the case represented in fig. 1 the greater bulk of the coma or penumbra falls *towards* the optic axis of the lens, and the brighter end away from it. Now in fig. 2 is shown another form of lens whose curves are bulged towards the right hand. Here the manner in which symmetrical and eccentric

pairs of oblique rays respectively are refracted by the lens is exactly opposite in character to that exhibited in fig. 1 ; C_1 being the ultimate focus for the central ray C_1 - - C_1, and the focal points B_1+b_1, D_1+d_1, for symmetrical pairs of rays B_1 and b_1 and D_1 and d_1 being displaced along the primary focal curve P - - f_1 in the opposite direction to that prevailing in fig. 1. In the case of fig. 2, therefore, the "coma" or penumbra, fig. 2 *a*, is opposite in character to fig. 1 *a*, its more diffused bulk being thrown *away from* the optic axis A_1 - - A_1, and inspection of fig. 2 makes it clear that in order to flatten the field of view a diaphragm or stop should be placed in front of the lens, and not behind it. The behaviour of these two lenses is thus opposite in character ; they both give what I may conveniently call unsymmetrical oblique refraction, but of opposite tendencies ; therefore it will easily be seen that a lens intermediate in form between that shown in fig. 1 and that shown in fig. 2 should be possible, which would be free from this unsymmetrical oblique refraction. This is actually the fact. Fig. 3 illustrates the action of such a lens.

In figs. 1 and 2 we get a focus for oblique rays in which are present the inevitable faults of astigmatism and curvature of field, with the additional fault of "coma" superimposed ; while in fig 3 we get astigmatism and curvature of field only, without the further blemish of "coma," and consequently if we are using a lens at open aperture, as is done in the case of telescope objectives for photographic purposes, then the best possible image off the axis is secured when such objective is designed to be free from "coma." On inspecting fig. 3, since it is seen that all pairs of rays whatsover, whether symmetrical or eccentric, intersect or come to focus (in primary planes) at one and the same point f_2, *it follows that no diaphragm or stop, whether placed in front of or behind the lens, can exert any effect whatever in the way of either flattening or rounding the field of view.* Therefore if an objective is required which will give the best possible definition off the optic axis when used at open aperture, then its curves must be so calculated that its field of view cannot be either flattened or rendered more curved by the presence of any stop, either in front of or behind the objective ; or, in other words, its diaphragm corrections must be eliminated or reduced to zero.

A formula is therefore required which will render this calculation possible. Rather more than a year ago I undertook a mathematical investigation of the form of an oblique pencil of rays after refraction through one or more lenses, both when such lenses were used at open aperture, and also when armed with stops or diaphragms, either in front or behind them, partly on the lines laid down by Coddington in his *System of Optics*, but in my own investigations dealing with large apertures and taking fully into account the effects of spherical aberration upon oblique rays at each surface. I undertook this on independent lines, partly

because I could not follow Coddington throughout his processes, for he does not always clearly explain himself, as students of his work often realise. I cannot give within reasonable space the processes* by which I arrived at the general formula which I here venture to present, and which I have found to be in exact agreement with practice, provided that the thicknesses of the lenses are not disproportionately large. The formula represents a correction to the *reciprocal* of the focal length, and I will write it in a form suited to an objective of two lenses :

μ = refractive index of 1st lens
M = „ of 2nd lens
f_1 = principal focal length of 1st lens
f_2 = „ of 2nd lens

α_1 (as in *Coddington's Optics*) is the characteristic of the relative state of divergence or convergence of the axial rays entering the 1st lens; thus if + or $-u$ is the distance (measured axially) from which rays are diverging, or to which they are converging respectively into 1st lens, then

$$\frac{1+\alpha_1}{2f_1}=\frac{1}{u}$$

as the case may be; while

$$\frac{1-\alpha_1}{2f_1}=\frac{1}{v}$$

or the reciprocal of the corresponding conjugate focus, with its sign assessed consistently with that of $\frac{1}{u}$.

α_2 expresses the same for the 2nd lens as α_1 does for the 1st lens.

x_1 is the characteristic of the *shape* of the 1st lens, in the same sense as in Coddington's notation.

Thus, let

$$\frac{1}{\rho_1}=\frac{1}{r_1}+\frac{1}{s_1}$$

or the sum of the reciprocals of the two radii, which are of the same (+) sign if turned in opposite ways (as in a double convex or double concave lens), and of opposite signs when turned the same way (as in a positive or negative meniscus lens); then

$$\frac{1+x_1}{2\rho_1}=\frac{1}{r_1} \text{ and } \frac{1-x_1}{2\rho_1}=\frac{1}{s_1},$$

* The formulæ previously given are deduced from these processes.

or, as Coddington expresses it,

$$\frac{1+x_1}{2(\mu-1)f_1}=\frac{1}{r_1} \text{ and } \frac{1-x_1}{2(\mu-1)f_1}=\frac{1}{s_1}.$$

Thus, according to Coddington's beautiful device, if a lens is equi-convex, then its characteristic $x=0$; if it is convexo-plane, then $x=+1$; if plano-convex, then $x=-1$; and, it always being premised in this system that light passes through lenses from left to right, a meniscus with its convex side towards the left has its characteristic $x=$ something greater than 1; if turned round the other way, x is minus quantity greater than 1, its numerical value being the same. Thus, turning a lens back to front merely changes the *sign* of its characteristic x.

x_2=the characteristic of the shape of the 2nd lens.

U=the axial distance from the 1st lens of the point from which the light is diverging.

D = the distance of the stop or diaphragm from the centre of the first lens. When D is in front of a lens (whether a positive or negative lens) then it is of + sign, but when behind a lens it is of — sign.

In the following formula it should be carefully borne in mind that the two terms U and D, wherever they occur, have their value determined in reference to the *first* lens only; for, in the formulæ extended for three, four, or more thin lenses in contact, the values of U and D, if the stop is in front (or V and —D if the stop is behind), must be determined solely in relation to that lens which lies next to the stop, the necessity for allowing for *virtual* images of the stop being obviated in this method.

ϕ = the angle of obliquity, or the angle included between the optic axis and that ray of the entering pencil which passes through the centre of the lens.

Premising, moreover, that the corrected focal distance for an oblique pencil is measured parallel to the optic axis, or, in other words, referred to the axis by dropping a perpendicular to the latter, and that the *axial* focal length is the standard to whose reciprocal the correction expressed by the following formula is to be applied in order to arrive at the focal length for the oblique pencil, then we have the following formula relating to the case of a double objective with crown lens placed first and with a stop or diaphragm placed axially at a distance D in front of the crown lens.

Then the correction to the reciprocal of the axial focal length is, for rays in *primary* * planes:

* The formula for rays in secondary planes is exactly the same, except that $3\tan^2\phi$ is replaced by $\tan^2\phi$.

$$\frac{3\tan^2\phi}{8f_1{}^3\mu(\mu-1)}\left[\left\{\frac{\mu+2}{\mu-1}x_1{}^2+4(\mu+1)\alpha_1x_1+(3\mu+2)(\mu-1)\alpha_1{}^2+\frac{\mu^3}{\mu-1}\right\}\right.$$

$$\left.+2f_1\left\{4\mu^2\alpha_1+2(\mu+1)(x_1-\alpha_1)\right\}\frac{U-D}{UD}\right]\frac{D^2U^2}{(U-D)^2}$$

$$-\frac{3\tan^2\phi}{8f_2{}^3M(M-1)}\left[\left\{\frac{M+2}{M-1}x_2{}^2+4(M+1)\alpha_2x_2+(3M+2)(M-1)\alpha_2{}^2+\frac{M^3}{M-1}\right\}\right.$$

$$\left.-2f_2\left\{4M^2\alpha_2+2(M+1)(x_2-\alpha_2)\right\}\frac{U-D}{UD}\right]\frac{U^2D^2}{(U-D)^2}.$$

The first two lines express the diaphragm corrections for the first or crown lens in the way of alteration in the curvature of its image, dependent upon the presence of the stop in front; while the last two lines express the corrections for the second or negative lens due to the presence of the same stop in front. Now we have already concluded that the form of objective which will give the largest possible field when used at open aperture, or yield the best possible lateral image, is a form which cannot in any way have its field of view modified by the presence of a stop placed at any distance either in front of or behind it, an objective, in fact, *whose curves are such that the formulæ expressing its diaphragm corrections equate to* o.

On inspecting the above formulæ, students of optics familiar with Coddington's work* will at once recognise in the first and third lines the formulæ which express the spherical aberration of the objective, only that y^2 is replaced by the common factor

$$\left(\frac{DU}{U-D}\right)^2 3\tan^2\phi.$$

These two lines multiplied by the above factor then express those diaphragm corrections or modifications of the curvature of field which are dependent upon the presence of spherical aberration in the objective. But since a properly constructed

* Those who have at all followed Coddington in his investigation of the form of a pencil of rays after refraction through a lens eccentrically and obliquely, will be aware that the results he arrives at are decidedly confusing, diaphragm corrections due to the spherical aberration of the lens and diaphragm corrections depending upon the *form* of the lens (on which latter the amount of "coma" is dependent) being altogether mixed up. His results are only useful when applied to pencils of very small aperture, and there is little doubt that it was the confusion I have just alluded to, which prevented him realising the advantages which one form of lens may have over another when used at open aperture, and prompted him to write (See his *System of Optics*, page 159): "The next question that offers itself is the advantage to be derived from a combination of lenses when a pencil passes through it centrically but obliquely. It will, however, easily be seen that as *the effects of obliquity in this case are totally independent of the form of a single lens*, so they cannot be removed or diminished by any combination." The italics are my own.

objective is necessarily free from spherical aberration, these first and third lines of the formulæ may be neglected as being equal to zero, and we get, after crossing out common factors,

$$\frac{1}{f_1^2\mu(\mu-1)}\left\{2\mu^2\alpha_1+(\mu+1)(x_1-\alpha_1)\right\}$$

for crown lens

$$+\frac{1}{f_2^2 M(M-1)}\left\{2M^2\alpha_2+(M+1)(x_2-\alpha_2)\right\}$$

for negative lens.

Expressing f_2 by δf_1, this formula will be found to equate to o when

$$x_2=-x_1\frac{\delta^2 M(M-1)(\mu+1)}{\mu(\mu-1)(M+1)}-\frac{(M-1)\{\delta^2 M(2\mu+1)\alpha_1+\mu(2M+1)\alpha_2\}}{\mu(M+1)}.$$

This is the condition under which the objective is free from "coma," and therefore yields the best possible lateral image. As a concrete instance, let an objective of ordinary crown and flint be considered where, since the incident rays are parallel,

$$_1=-1\ ;\ \mu_G=1\ ;\ \cdot5276 \text{ and } M_G=1\cdot6415,$$

and δ, or the dispersive ratio for the spectrum interval F to G $=1\cdot762$, which is therefore the focal ratio, on the condition that the rays F and G are brought to the same focus. Inserting these values in the above formula, we get

$$x_2=-3\cdot88234\,x_1+\cdot66056.*$$

This value for x_2 may then be inserted in the formulæ for spherical aberration, which will be found to equate to o when

$$x_1=-\cdot255.$$

* There is another method of arriving at the curves for an objective free from "coma," provided that the most exact result is not required. It can be proved that if an objective is so designed that it shall be as nearly as possible aplanatic for converging and diverging rays as well as for parallel rays, then it will be very approximately free from coma when focussed on infinitely distant objects. Thus, if the formula expressing the spherical aberration of the objective is differentiated with respect to α_1 and α_2 (changes in the values of which, of course, express changes in the state of convergence or divergence of the entering rays), and the relative values of x_1 and x_2 which are necessary to equate the differential coefficient to o when $\alpha_1 = -1$ are then inserted in the complete formula for spherical aberration, then the latter, on being equated to o, will yield the proper value for x_1 and x_2. This method should and does yield a form of objective whose curves are rather more bulged towards the focus than the form obtained by the more exact method of eliminating diaphragm corrections.

Therefore the radius of the first surface of the crown lens will be to the radius of the second surface as 5 : 3, broadly speaking. This calculation is exactly verified by practical results. In Fig. 4 I have represented an objective of this form. The inner curve of the flint is only very slightly flatter than that of the crown, and if a crown of lower dispersive power, such as Schott's boro-silicate crown (a very hard and beautifully colourless glass) were united with a dense flint, such as is used for ordinary prisms, then all the optical conditions may be satisfied consistently with the two inner curves being worked exactly to the same radius, so as to permit of cementing, if the objective is not too large for this to be practicable.

On tilting such an objective as this ever so much out of square, no trace of coma will be shown, the appearances being astigmatism pure and simple, as shown in Fig. 3 *a*, and varying in amount according to the square of the tangent of the angle of obliquity. It scarcely needs pointing out that an objective approaching this form is also highly desirable for transit instruments, whose eyepieces are often provided with a large amount of lateral travel.

Buckingham Works, York:
1893 *April* 8.

Results of Double-Star Measures with the 8-inch Equatoreal at Windsor, N. S. Wales, in 1892. By John Tebbutt.

Ref. No.	Star.	Observed Magnitude.	Approx. Place of Star. R. A.	Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.		Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
1	*p* Eridani	...	1 36	56 45	·750	225·7	10	...	...	300	2 50 E	2 27 E	...
2	,,	...	,,	,,	·925	...	...	7·01	6	170	1 28 E	1 17 E	4
3	,,	...	,,	,,	·925	226·4	10	...	...	230	1 3 E	0 44 E	4
4	,,	...	,,	,,	·928	226·9	10	...	...	300	1 30 E	1 11 E	4
5	*h* 4373	9, 9	10 44	41 0	·457	...	...	6·01	5	100	2 31 W	2 41 W	2
6	*α* Crucis	...	12 21	62 30	·482	120·0	10	4·92	6	...	2 17 E	1 47 E	3 & 2
7	,,	...	,,	,,	·542	116·6	10	4·82	7	300	1 33 W	2 3 W	4
8	*γ* Centauri	...	12 36	48 22	·441	0·0	10	...	...	300	2 22 E	2 4 E	4
9	,,	6, 6	,,	,,	·444	359·0	10	...	...	300	2 13 E	1 50 E	4
10	,,	...	,,	,,	·446	...	...	1·46	10	170	2 47 E	2 26 E	4
11	,,	...	,,	,,	·449	...	...	1·42	10	170	2 37 E	2 21 E	4
12	,,	4, 4	,,	,,	·457	...	...	1·94	10	170	1 1 W	1 24 W	3
13	,,	4, 4	,,	,,	·460	359·8	10	1·71	10	300	2 2 E	1 27 E	4
14	,,	...	,,	,,	·482	357·3	10	1·69	10	300	1 47 E	1 10 E	5
15	,,	...	,,	,,	·487	359·0	10	1·72	8	300	1 28 E	1 6 E	4
16	,,	...	,,	,,	·597	358·0	10	1·82	7	535	2 0 W	2 29 W	4
17	,,	...	,,	,,	·600	357·9	10	1·50	7	535	1 50 W	2 15 W	5
18	*γ* Virginis	...	12 56	0 51	·485	151·7	10	5·51	8	300	1 31 E	1 4 E	4

Ref. No.	Star.	Observed Magnitude.	Approx. Place of Star. R. A.	Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.		Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
19	γ Virginis	...	12 56	0 51	·545	152·9	10	5·61	8	300	0 19 W	0 46 W	4 & 3
20	β Muscæ	$3\frac{1}{2}$, $3\frac{1}{2}$	12 40	67 31	·457	...	...	1·32	8	170	1 34 W	1 58 W	1
21	,,	...	,,	,,	·457	333·2	10	...	...	300	2 14 W	2 26 W	1
22	,,	...	,,	,,	·460	337·7	10	...	...	300	1 18 E	0 58 E	2
23	,,	...	,,	,,	·460	335·9	5	...	...	300	0 3 W	0 9 W	3
24	,,	...	,,	,,	·471	334·2	10	1·34	8	300	1 37 E	1 6 E	4
25	,,	...	,,	,,	·476	338·7	10	...	...	535	1 28 E	1 10 E	1
26	,,	...	,,	,,	·482	335·0	10	...	...	300	3 20 E	2 54 E	3
27	,,	...	,,	,,	·487	334·7	8	...	...	300	1 4 E	0 48 E	2
28	,,	...	,,	,,	·542	336·5	10	...	...	300	0 25 W	0 39 W	2
29	h 4634	8, 9	13 51	55 28	·441	19·9	10	...	...	140	1 19 E	1 0 E	...
30	,,	8, 9	,,	,,	·444	20·1	10	...	...	140	2 6 E	1 36 E	3
31	,,	8, 9	,,	,,	·446	...	...	12·64	7	110	1 28 E	0 24 E	3
32	,,	8, 9	,,	,,	·449	...	...	12·84	10	100	1 58 E	1 33 E	3
33	,,	8, 9	,,	,,	·471	19·4	10	12·11	7	140	1 7 E	0 33 E	3
34	α Centauri	...	14 32	60 23	·441	205·3	10	...	...	230	1 21 E	1 1 E	3
35	,,	1, 2	,,	,,	·444	206·1	10	...	...	300	2 0 E	1 46 E	2
36	,,	...	,,	,,	·446	...	...	19·80	10	170	4 12 E	3 54 E	3
37	,,	1, 2	,,	,,	·449	...	...	20·24	10	170	4 6 E	3 44 E	3
38	,,	...	,,	,,	·460	205·1	10	...	...	140	4 37 E	4 24 E	4

Ref. No.	r.	Observed Magnitude.	Approx. Place of Star. R. A.	Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.		Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
39	α Centauri	1, 2	14 32	60 23	·460	205·4	10	...	...	140	4 24 E	4 11 E	4
40	,,	...	,,	,,	·463	205·3	10	19·67	10	300	3 52 E	3 20 E	3
41	,,	...	,,	,,	·463	205·9	10	...	...	300	1 36 E	1 14 E	3
42	,,	...	,,	,,	·471	205·4	10	19·30	7	300	0 39 E	0 11 E	3
43	,,	...	,,	,,	·482	205·7	10	19·37	7	...	3 2 E	2 37 E	4
44	,,	...	,,	,,	·485	205·5	10	19·58	6	300	0 47 E	0 21 E	4
45	,,	...	,,	,,	·526	205·7	10	19·85	10	300	1 40 W	2 12 W	3
46	,,	...	,,	,,	·597	206·0	10	...	...	535	1 41 W	2 0 W	4
47	,,	...	,,	,,	·600	205·4	10	...	...	535	1 9 W	1 30 W	3
48	,,	...	,,	,,	·613	206·0	10	...	...	535	0 30 W	0 49 W	2
49	,,	...	,,	,,	·613	205·6	10	19·97	7	535	3 20 W	3 53 W	4
50	,,	...	,,	,,	·753	206·7	10	19·89	10	300	1 38 W	2 13 W	3
51	π Lupi	5, 5	14 58	46 38	·441	86·5	10	...	...	300	1 10 E	0 48 E	2
52	,,	5, 5	,,	,,	·444	86·9	10	...	...	300	1 59 E	1 43 E	4
53	,,	5, 5	,,	,,	·446	..	...	1·34	6	170	1 16 E	1 6 E	3
54	,,	5, 5	,,	,,	·449	...	...	1·41	8	170	2 15 E	1 56 E	3
55	,,	...	,,	,,	·460	87·0	10	...	...	300	0 48 E	0 30 E	3
56	,,	...	,,	,,	·753	88·1	10	1·48	5	300	3 52 W	4 15 W	3
57	,,	...	,,	,,	·756	88·7	10	1·47	5	300	4 6 W	4 30 W	4
58	Lacaille, 6477	7, 7	15 38	65 6	·471	155·8	10	1·96	8	300	1 5 E	0 38 E	5
59	,,	7, 7	,,	,,	·485	154·3	10	2·07	5	300	0 43 E	0 12 E	3

Ref. No.	Star.	Observed Magnitude.	Approx. Place of Star. R. A.	Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.		Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
60	ρ Ophiuchi	...	16 19	23 12	·438	354·8	10	3·23	8	300	...	0 4 W	...
61	„	...	„	„	·463	354·7	10	3·39	8	300	2 7 E	1 36 E	4
62	36 Ophiuchi	...	17 9	26 26	·463	195·3	10	4·32	7	300	2 8 E	1 42 E	4 & 3
63	„	4, 4	„	„	·471	195·7	10	4·11	7	300	1 56 E	1 30 E	5
64	Brisbane, 6556	7, 7¼	18 54	37 13	·460	281·3	10	12·57	7	230	3 16 E	2 41 E	4
65	γ Cor. Aust.	...	18 59	37 13	·460	173·4	10	...	...	300	2 42 E	2 23 E	3
66	„	4. 4	„	„	·471	173·9	10	1·69	10	300	2 58 E	2 33 E	5
67	„	...	„	„	·753	170·5	10	1·61	10	300	1 53 W	2 44 W	5
68	„	...	„	„	·756	174·7	10	...	...	300	1 10 W	1 42 W	4
69	„	...	„	„	·756	172·2	10	...	...	300	2 57 W	3 22 W	5

Remarks.

The columns headed "Hour Angles" denote the hour angles between which the measures were made, and the last column the weight assigned to the observations from a consideration of the conditions under which they were made. 1 denotes the worst and 5 the best conditions possible.

Nos. 2, 3, 4, 5, 7, 8, 13, 14, 15, 16, 17, 18, 20, 21, 26, 29, 33, 34, 38, 39, 40, 41, 42, 43, 44, 45, 49, 61, 62, 63, 65, 66, 67, 69. The line joining the observer's eyes was parallel to that joining the components.

Nos. 6, 12, 19, 22, 23, 24, 27, 28, 46, 47, 48, 50, 51, 56, 57, 58, 59, 64, 68. These lines were at right angles.

Nos. 8, 9, 10. 11, 12, 13, 15, 18, 20, 51, 52, 53, 54, 58, 59, 63, 65. Components equal.

No. 5. The determination of the place of this star is uncertain.

No. 25. Observations of little value.

No. 26. The south component certainly the brighter.

No. 32. The clock acted badly.

Nos. 38, 39, 45, 50. Measures in sunlight.

Nos. 2, 4, 13, 28, 48, 56, 57. Measures in twilight.

Nos. 14, 40. Measures partly in sunlight and partly in twilight.

Windsor, N. S. Wales:
1893 *February* 11.

On the Orbit of O Σ 285. By J. E. Gore.

Recent measures made by Mr. Burnham with the 36-inch refractor of the Lick Observatory, show that the angular change in this pair, since its discovery, amounted last year to 270°. I have computed the orbit and find the following provisional elements:—

Elements of OΣ 285.

P = 118·57 years	Ω = 106° 58′
T = 1881·93	λ = 161° 24′
e = 0·58	a = 0″·46
i = 45° 42′	μ = −3°·036

The following is a comparison between the measures used in computing the orbit and the positions computed from the above elements. A correction of 180° has been applied to the measures marked with an asterisk, the components being nearly equal in brightness:—

Epoch.	Observer.	θ	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
		°	°	°	″	″	″
1845·80	O. Struve	72·2	73·5	−1·3	0·61	0·56	+0·05
1847·96	Mädler	72·2	70·9	+1·3	0·42	0·53	−0·11
1852·69	,,	60·6	64·2	−3·6	0·45	0·48	−0·03
1852·74	O. Struve	57·8	64·1	−6·3	0·50	0·48	+0·02
1855·84	,,	53·9	58·8	−4·9	0·51	0·44	+0·07
1857·50	Secchi	65·5	55·6	+9·9	0·4	0·41	−0·01
1865·50	Dembowski	36·5	32·3	+4·2	oblong?	0·30	...
1881·50	Burnham		Round or doubtful			0·19	...
1883·84	Engelmann	*258·3	252·4	+5·9	0·22	0·17	+0·05
1885·40	Perrotin	*225·0	232·3	−7·3	oblong?	0·16	...
1887·56	Schiaparelli	202·2	204·3	−2·1	0·24	0·17	+0·07
1891·30	Burnham	168·7	169·0	−0·3	0·24	0·23	+0·01
1892·30	,,	162·2	162·2	0·0	0·21	0·25	−0·04

Assuming that the mass of the system is equal to the mass of the Sun, the "hypothetical parallax" would be

$$p = \frac{a}{P^{\frac{2}{3}}} = 0''{\cdot}019.$$

The magnitudes of the components are about 7·0, 7·2; and the approximate position of the pair for 1880·0 is

R.A. $14^h\ 41^m$
Decl. +42° 53′.

Observations of the recent Conjunction of Saturn and γ Virginis made at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

The following observations of differences of R.A and N.P.D. were made with the $12\frac{3}{4}$-inch Merz Refractor mounted on the Lassell Equatorial, the power used being 285. The differences of R.A. were recorded on one of the portable chronographs, and the differences of N.P.D. were measured with a filar micrometer:—

TABLE I.

G.M.T. of Observation.	γ' Virg.-Sat. Corrected for Refraction and Parallax.	γ² Virg.-Sat. Corrected for Refraction and Parallax.	Diameter of Saturn.	Deduced R.A. of Sat. Reduced to Time of Meridian Passage.	Observer.
d h m s	m s	m s	s	h m s	
Apr. 10 9 46 46	0 38·78	...	1·26	12 35 35·82	L.
49 29	38·84	...	·24	·80	L.
54 54	38·88	...	·21	·82	L.
56 1	...	0 39·03	·25	·87	L.
57 17	...	39·16	·23	·76	L.
58 38	...	39·08	·27	·86	L.
10 0 36	39·06	...	·23	·70	L.
1 55	38·95	...	·24	·83	L.
3 12	39·00	...	·25	·79	L.
6 45	39·01	...	·38	·82	H. T.
8 22	...	39·29	·29	·75	H. T.
9 43	...	39·21	·25	·84	H. .
10 56	39·08	...	·26	·80	H. T.
12 29	...	39·28	·33	·80	H. T.
15 14	39·10	...	·31	·82	H. T.
32 32	39·16	...	·33	·96	L.
34 17	...	39·57	·25	·77	L.
35 27	39·27	...	·23	·89	L.
36 32	...	39·53	·23	·83	L.
37 43	39·37	...	·33	·81	L.
48 23	39·44	...	·21	·87	L.
49 30	...	39·72	·29	·79	L.
50 46	39·49	...	·26	·84	L.
51 53	...	39·62	·26	·92	L.

G.M.T. of Observation.	γ' Virg.-Sat. Corrected for Refraction and Parallax.	γ² Virg.-Sat. Corrected for Refraction and Parallax.	Diameter of Saturn.	Deduced R.A. of Sat. Reduced to Time of Meridian Passage.	Observer.
d h m s	m s	m s	s	h m s	
Apr. 10 10 53 35	39·52	...	·23	12 35 35·85	L.
54 39	...	39·70	·29	·87	L.
12 9 12 3	1 11·33	...	·21	2·97	L.
13 54	...	1 11·63	·22	·88	L.
15 40	11·41	...	·28	·93	L.
17 26	...	11·60	·23	·95	L.
19 17	11·39	...	·28	·99	L.
21 9	...	11·69	·29	·90	L.
49 2	11·75	...	·24	·97	L.
50 43	...	11·97	·26	·96	L.
52 31	11 68	...	·29	3·08	L.
54 13	...	12·05	·23	2·92	L.
10 17 57	12·16	...	·21	·90	L.
19 46	...	12·32	·26	·95	L.
21 34	12·23	...	·28	·87	L.
23 9	...	12·37	·24	·94	L.
41 58	12·39	...	·23	·94	L.
43 43	...	12·64	·26	·96	L.
45 25	...	12·61	·27	·95	L.
47 11	12·47	...	·28	·92	L.
49 14	12·48	...	·26	·93	L.
50 58	...	12·68	1·29	2·95	L.

The initials H. T. and L. are those of Mr. Turner and Mr. Lewis respectively.

	R.A. h m s	N.P.D. ° ′ ″
Assumed apparent place of γ^1	12 36 15·65	90 51 53·6
„ „ γ^2	15·84	58·7

The apparent place is sensibly the same on both days.

The authority for these is the Greenwich Five-Year Catalogue of Fundamental Stars 1890·0.

	R.A. d h m s	N.P.D. ° ′ ″
N.A. Tabular place of *Saturn* at Meridian passage	10 12 35 36·04	90 53 54·0
„ „ „ „	12 12 35 3·15	90 50 28·9

TABLE I. (Part 2).

Differences of N.P.D. of Saturn and γ^1 and γ^2 Virginis.

G.M.T. of Observation.				γ^1 Virg.-Sat. Corrected for Refraction and Parallax.	γ^2 Virg.-Sat. Corrected for Refraction and Parallax.	Diameter of Saturn.	Difference of γ^1-γ^2 Virg.	Seconds of Deduced N.P.D. of Saturn reduced to time of Meridian Passage.		Observer.
								from γ^1	from γ^2	
d	h	m	s	′ ″	′ ″	″	″	″	″	
Apr. 10	10	21	33	−2 2·24	−1 56·97	18·25	5·27	51·8	51·6	L.
		23	35	2·93	57·90	18·14	5·03	52·6	52·6	L.
		24	30	2·18	57·26	18·25	4·92	51·9	52·1	L.
		25	30	2·46	57·04	18·30	5·42	52·2	51·9	L.
		27	7	2·28	57·04	18·58	5·24	52·2	52·0	L.
		40	28	1·78	57·27	17·88	4·51	52·7	53·2	L.
		41	48	0·76	55·95	18·54	4·81	51·7	52·0	L.
		42	56	2·14	56·90	18·64	5·22	53·2	53·1	L.
		44	9	1·13	56·13	18·54	5·00	52·3	52·3	L.
		46	3	1·63	56·91	18·23	4·72	52·9	53·3	L.
12	9	35	23	+1 19·89	+1 24·56	18·33	4·67	27·0	27·5	L.
		37	15	20·06	25·14	19·66	5·08	27·0	27·0	L.
		39	26	20·04	24·40	18·98	4·36	27·2	27·9	L.
		42	23	20·01	25·08	18·91	5·07	27·4	27·4	L.
		44	25	19·92	24·58	18·82	4·66	27·6	28·1	L.
		59	37	21·26	26·32	18·44	5·06	27·4	27·4	L.
	10	1	41	21·95	27·21	17·60	5·26	26·8	26·7	L
		10	2	22·46	27·39	18·25	4·93	26·9	27·1	L.
		12	0	22·62	27·63	18·52	5·01	26·9	27·0	L.
		13	56	22·46	27·02	17·56	4·56	27·2	27·7	L.
		32	1	22·91	27·93	17·32	5·02	28·0	28·1	L.
		33	42	23·98	28·89	17·60	4·91	27·1	27·3	L.
		35	32	23·86	28·70	18·10	4·84	27·3	27·6	L.
		37	12	24·80	29·52	17·55	4·72	26·5	26·9	L.
		39	0	24·54	30·06	18·33	5·52	26·9	26·4	L.

Collecting the results, we obtain—

Correction to Tabular R.A. of Saturn, as given in the "Nautical Almanac."

Date.	Observer.	From γ^1.		From γ^2.	
		s	s	s	s
Apr. 10	L.	−0·208	±·008	−0·206	±·010
	H. T.	−0·227	±·020	−0·243	±·020
12	L.	−0·200	±·009	−0·220	±·009

Correction to Tabular N.P.D. of Saturn.

Apr. 10	L.	−1″·65	±0″·11	−1″·59	±0″·11
12	L.	−1·75	±0·10	−1·56	±0·10

Preparations were also made for observations on April 8 and 9, but no measures could be obtained, as during the earlier part of the night *Saturn* was behind the new building (on which the Lassell Equatorial is shortly to be mounted), and the sky clouded over afterwards on each night.

Saturn and γ *Virginis* were also observed with the transit circle on April 10 and 12, and the following are the resulting differences of R.A. and N.P.D.:—

TABLE II.

G.M.T.	Observer.	γ^1−Sat. R.A.	γ^2−Sat. R.A.	γ^1−Sat. N.P.D.	γ^2−Sat. N.P.D.	Diameter. R.A.	Diameter. N.P.D.
d h m		m s	m s	′ ″	′ ″	s	″
Apr. 10 11 18·0	R. C.	0 39·75	...	−2 0·55	...	1·16	19·71
12 11 9 6	H.	1 12·66	1 12·97	1 25·83	1 31·47	1·30	18·66

The N.P.D. differences are corrected for refraction and parallax.

The initials R. C. and H. are those of Mr. Cheeseman and Mr. Hollis.

Photographs of *Saturn* and γ *Virginis* were taken with the Astrographic Equatorial on April 7, 10, 12, and 13 with a series of exposures and trails for orientation.

Royal Observatory, Greenwich:
1893 *April* 14.

Revised Places of Comets observed at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

Since the comet observations in the *Monthly Notices*, vol. liii. Nos. 1 to 5, were communicated to the Society, more accurate places have been found for many of the comparison stars, chiefly in the Lund and Leiden zones. These places are given below, together with the resulting positions of the comets.

Holmes' Comet (*f* 1892).

Greenwich Mean Solar Time.	R.A. of ✱.	N.P.D. of ✱.	Comp. ✱	References to *Monthly Notices* of R.A.S.
1892. d h m s	h m s	° ′ ″		
Nov. 9 9 36 26	0 45 51·90	51 41 19·4	*k*	Vol. liii., No. 1, p. 52
9 11 22 53	0 45 52·51	51 41 33·1	*g*	,, ,, ,,
10 6 17 48	0 45 23·61	51 46 12·6	*k*	,, ,, ,,
10 6 17 48	0 45 26·10	51 45 51·7	*e*	,, ,, ,,
10 6 25 3	0 45 27·30	51 45 48·6	*e*	,, ,, ,,
12 8 27 17	0 44 28·31	51 59 11·2	*e*	,, No. 2, p. 67
12 8 29 49	0 44 30·30	51 58 32·0	*i*	,, ,, ,,

Greenwich Mean Solar Time.	R.A. of ☄.	N.P.D. of ☄.	Comp.	References to *Monthly Notices* of R.A.S.
1892. d h m s	h m s	° ′ ″		
Nov. 12 8 29 52	0 44 32·38	51 58 51·2	*i*	Vol. liii. No. 2, p. 67.
12 8 35 58	0 44 28·17	51 58 47·8	*e*	,, ,, ,,
14 6 21 19	0 43 45·65	52 9 12·7	*i*	,, ,, ,,
14 6 37 45	0 43 41·43	52 10 13·7	*d*	,, ,, ,,
14 6 43 58	0 43 47·03	52 10 22·5	*i*	,, ,, ,,
14 7 3 14	0 43 44·02	52 10 36·2	*d*	,, ,, ,,
14 7 27 0	0 43 42·23	52 10 42·4	*d*	,, ,, ,,
14 7 58 12	0 43 45·94	52 10 36·0	*e*	,, ,, p. 68
14 8 2 6	0 43 47·77	52 10 39·0	*e*	,, ,, p. 67
14 8 2 6	0 43 48·19	52 10 38·9	*f*	,, ,, ,,
17 8 50 30	0 42 51·64	52 29 37·4	*d*	,, ,, p. 68
18 6 5 48	0 42 38·28	52 35 21·9	*h*	,, ,, ,,
18 6 19 54	0 42 38·97	52 35 26·0	*d*	,, ,, ,,
18 7 25 21	0 42 30·97	52 36 24·9	*h*	,, ,, ,,
18 10 8 2	0 42 31·74	52 36 21·6	*d*	,, ,, ,,
20 6 20 17	0 42 19·72	52 48 8·7	*c*	,, ,, ,,
21 7 10 38	0 42 9·72	52 55 8·5	*c*	,, ,, ,,
21 8 9 47	0 42 9·43	52 56 45·5	*c*	,, ,, ,,
26 9 2 3	0 42 9·36	53 27 14·6	*b*	,, ,, ,,
26 9 15 49	0 42 10·06	53 27 26·5	*a*	,, ,, ,,
1893. Jan. 20 9 27 41	1 27 2·17	56 21 7·8	*n*	,, No. 5, p. 344
24 9 24 19	1 32 33·70	56 19 34·1	*o*	,, ,, ,,
Feb. 4 7 9 34	1 48 25·84	56 7 54·9	*p*	,, ,, ,,
4 8 36 20	1 48 35·32	56 8 20·9	*p*	,, ,, ,,
5 8 49 7	1 50 3·80	56 6 34·2	*p*	,, ,, ,,
5 9 42 12	1 50 10·24	56 7 18·0	*q*	,, ,, ,,
6 6 42 56	1 51 27·11	56 4 54·0	*q*	,, ,, ,,
6 7 14 24	1 51 30·97	56 5 0·5	*q*	,, ,, ,,
7 8 12 19	1 53 8·37	56 3 15·5	*q*	,, ,, ,,
8 7 6 17	1 54 34·97	56 1 27·1	*r*	,, ,, 345
8 7 24 9	1 54 36·79	56 1 12·5	*q*	,, ,, ,,
10 7 41 29	1 57 44·16	55 58 18·1	*s*	,, ,, ,,
14 8 47 14	2 4 14·26	55 50 43·5	*t*	,, ,, ,,
15 9 50 59	2 5 51·84	55 48 31·4	*u*	,, ,, ,,
16 6 59 23	2 7 16·47	55 46 18·8	*u*	,, ,, ,,
16 7 5 18	2 7 15·82	55 46 24·4	*v*	,, ,, ,,
Brooks' Comet (g 1892).				
1892. Dec. 15 14 26 11	13 51 16·50	57 42 23·6	*l*	Vol. liii., No. 3, p. 134

Improved Mean Places of Comet Comparison Stars.

	Star's Name.	R.A., 1892·0. h m s	N.P.D., 1892·0. ° ′ ″	Authority.
a	W.B. (2) 0, 1013	0 40 58·60	53 33 49·6	Lund Z., 320, 324
b	W.B. (2), 0, 1021	0 41 23·22	53 18 51·3	Lund Z., 335
c	W.B. (2), 0, 1029	0 41 47·88	52 57 30·5	Lund Z., 335
d	Lalande, 1323	0 43 38·27	52 23 3·1	Lund Z., 310, 316, and 2 Paris Observations
e	W.B. (2), 0, 1083	0 44 5·98	51 50 56·7	Lund Z., 320, 324, 348, and 2 Pulkova Observations
f	W.B. (2), 0, 1087	0 44 10·90	51 52 45·6	Lund Z., 366, and 2 Pulkova Observations
g	W.B. (2), 0, 1092	0 44 27·12	51 43 16·7	Lund Z., 91, 98
h	Lalande, 1384	0 45 16·77	52 32 39·3	Lund Z., 348, 366, and 2 Paris Observations
i	Lalande, 1443	0 46 56·60	52 2 16·5	Lund Z, 320, 324, and 1 Paris Observation
k	Lalande, 1444	0 47 1·87	51 32 55·4	Lund Z., 332, 356, and 1 Paris Observation
l	Lalande, 25647*	13 51 8·34	57 36 7·3	Leiden Z., 46, 48

* The Lalande place for 1892·0 should be N.P.D. 57° 35′ 55″·0, not 33′.

	Star's Name.	R.A., 1893·0. h m s	N.P.D., 1893·0. ° ′ ″	Authority.
n	Lalande, 2729	1 24 48·12	56 22 41·9	Leiden Z., 138, 242, 343, 398, and 2 Paris Observations
o	B.D. + 33°, 267	1 32 31·66	56 11 46·5	Leiden Z., 343, 398
p	W.B. (2), I., 1047	1 47 27·90	56 1 50·8	Leiden Z., 396, 398
q	Lalande, 3619	1 52 44·39	56 10 50·2	Leiden Z., 393, 396, and 2 Paris Observations
r	B.D. + 33°, 339	1 55 7·55	55 58 38·5	Leiden Z., 257, 325
s	W.B. (2), I., 1292	1 56 27·37	55 51 18·6	Leiden Z., 260, 337
t	B.D. + 34°, 382	2 3 35·10	55 41 33·1	Leiden Z., 239, 333
u	Lalande, 4092	2 7 41·46	55 52 43·7	Leiden Z., 239, 333, and 1 Paris Observation
v	B.D. + 34°, 396	2 8 0·13	55 35 29·8	Leiden Z., 239, 333

Royal Observatory, Greenwich:
1893 *April* 11.

Observations of Comets made at the Liverpool Observatory, 1892–93.

By William E. Plummer, M.A.

The following observations were made with the 8-inch equatoreal of the Liverpool Observatory, employing either a parallel wire micrometer, or an arrangement similar to that discussed by Colonel Tupman, *Monthly Notices*, vol. xlviii. p. 96, and known as the cross reticule. Of this latter form of micrometer, the observatory possesses two specimens, but neither is quite satisfactory in use. The principal defect seems to arise from the difficulty in destroying parallax, owing partially to the fact that the "cross wires," formed apparently of watch spring, are not in one and the same plane, and this difficulty seems to be aggravated by the low power of the eyepiece. Although all the precautions to which Colonel Tupman calls attention in his paper have been carefully attended to, it is feared that the places of the comets determined with this micrometer are not very trustworthy. They are marked by the abbreviation "Ret." I have in hand a series of observations to enable me to compare the relative accuracy of the determinations derived from the use of the "cross reticule" and the parallel wire micrometer, but the discrepancies in the results obtained on different nights are perplexing and inexplicable.

Observations of Comet VI., 1892.

Greenwich Mean Time of Observation.					♂−✶ R.A.	No. of Comps.	Apparent R.A. of Comet.	♂−✶ Declination.	No. of Comps.	Apparent Declination of Comet.	Log. Fact. of Parallax R.A.	Log. Fact. of Parallax δ	Reference to Comp. ✶
1892.	d	h	m	s	m s		h m s	′ ″		° ′ ″			
Sept.	24	12	39	3	+0 26·49	24	7 9 40·39	+ 2 23·4	6	+28 7 28·9	9·8282*n*	9·8671	*a*
	25	12	34	11	−5 18·32	24	7 12 33·50	+ 2 59·6	6	+27 53 47·8	9·8265*n*	9·8664	*b*
	29	12	58	22	−1 42·27	10	7 24 27·87	− 3 52·4	2	+26 53 9·2	9·8261*n*	9·8540	*c*
Oct.	4	13	16	2	−4 11·45	Ret.	...	− 0 55·2	Ret.	...	9·7988*n*	9·8437	
	16	13	55	20	−4 52·17	Ret.	8 18 22·35	− 1 48·7	Ret.	+20 45 27·3	9·7856*n*	9·8346	*d*
							Comet V., 1892.						
Oct.	20	7	15	5	+1 39·62	Ret.	19 48 47·74	− 3 6·9	Ret.	+10 1 32·9	9·2779	9·8378	*e*
	27	7	14	36	−4 19·72	Ret.	20 6 2·97	+ 1 21·2	Ret.	+ 7 30 14·6	9·3278	9·8571	*f*
							Comet III., 1892.						
Nov.	11	6	56	22	+0 49·53	20	0 44 58·45	− 1 35·3	4	+38 7 54·6	9·6779*n*	9·5334	*g*
	13	6	34	11	−2 52·70	15	0 44 6·83	− 2 14·8	5	+37 55 55·1	9·7067*n*	9·5545	*h*
	16	7	26	40	−0 34·54	20	0 43 6·66	− 0 7·9	4	+37 37 15·8	9·5175*n*	9·4841	*i*
	17	7	31	16	−0 49·67	24	0 42 51·52	− 6 39·2	5	+37 30 44·9	9·4805*n*	9·4781	*i*
	20	7	29	3	+0 26·90	15	0 42 17·64	+ 8 29·4	5	+37 11 26·1	9·4311*n*	9·4768	*j*
	21	6	55	30	+0 19·02	15	0 42 9·75	+ 2 7·5	5	+37 5 4·3	9·5532*n*	9·5066	*j*
	22	6	19	4	+0 14·75	20	0 42 5·49	− 3 42·4	5	+36 59 14·5	9·6509*n*	9·5448	*j*
	23	6	13	29	+2 41·56	20	0 42 2·82	+ 4 59·3	5	+36 52 58·2	9·6508*n*	9·5468	*l*

Greenwich Mean Time of Observation.					☄−★ R.A.	No. of Comps.	Apparent R.A. of Comet.	☄−★ Declination.	No. of Comps.	Apparent Declination of Comet.	Log. Fact. of Parallax R.A.	Log. Fact. of Parallax δ	Reference to Comp. ★
1892.	d	h	m	s	m s		h m s	′ ″		° ′ ″			
Dec.	10	9	17	46	−1 27·11	20	0 46 26·14	+ 5 9·8	5	+35 14 24·0	9·4875*n*	9·5316	*m*
	10	9	17	46	+4 16·87	20	0 46 26·22	+ 5 0·6	5	+35 14 23·7	9·4875*n*	9·5316	*n*
	16	9	0	24	−0 14·92	15	0 50 7·19	+ 7 21·3	5	+34 46 24·3	9·5030*n*	9·5442	*o*
	16	9	0	24	−1 52·32	15	0 50 7·11	− 0 50·2	5	+34 46 25·8	9·5030*n*	9·5442	*p*
1893. Jan.	18	6	58	40	−0 31·68	20	1 24 15·70	+ 1 27·7	5	+33 38 53·9	9·3668*n*	9·5468	*q*
	20	7	59	25	+2 12·15	15	1 26 59·53	...	...	...	9·6195*n*	...	*q*
	20	8	14	11	...	...	...	+ 1 32·4	3	+33 38 58·5	...	9·5979	*q*
	27	6	37	5	+2 22·75	20	1 36 38·59	− 5 29·9	5	+33 42 33·3	9·3754*n*	9·5465	*r*
Feb.	5	7	22	18	−2 45·06	15	1 49 58·42	+ 3 57·8	2	+33 53 16·6	9·6282*n*	9·5962	*s*
	15	8	35	11	−1 54·81	Ret.	2 5 45 66	+ 4 21·6	Ret.	+34 11 46·2	9·7978*n*	9·6944	*t*
	16	8	37	23	−0 18·76	Ret.	2 7 21·71	+ 6 25·9	Ret.	+34 13 50·5	9·8029*n*	9·6993	*t*
	16	8	37	23	−0 12·82	Ret.	2 7 23·02	+12 43·0	Ret.	+34 13 42·9	9·8029*n*	9·6993	*u*
							Comet I., 1893.						
1892. Nov.	26	17	59	12	+3 9·20	20	13 6 16·53	+ 5 5·8	4	+16 9 3·7	9·6294*n*	9·8106	*v*
	30	16	4	30	−2 15·64	20	13 12 45·31	+ 4 37·6	4	+18 24 28·0	9·7713*n*	6·8406	*x*
Dec.	15	17	49	16	−0 34·13	Ret.	13 51 51·05	− 8 1 8	Ret.	+32 28 37·0	9 6433*n*	9 6259	*y*
	28	17	26	5	+3 12·10	20	15 33 50·92	− 3 57·9	5	+55 35 16·2	9 9472*n*	9·2612	*z*
	28	17	26	5	+7 41·99	20	15 33 51 27	+ 1 50·6	5	+55 35 21·4	9·9472*n*	9·2612	*aa*

Mean Places of Stars of Comparison.

Star's Designation or Authority.	Mean R.A. Beginning of Year.	Corr. to Apparent Place.	Mean Decl. Beginning of Year.	Corr. to Apparent Place.	Letter of Ref.
	h m s	s	° ′ ″		
53 Geminorum	7 9 12·24	+1·66	+28 5 6·0	− 0·5	*a*
Paris Catalogue, 9059	7 17 50·19	+1·63	+27 50 45·7	+ 2·5	*b*
Bonn, vol. xi. +27°, No. 1410	7 26 8·43	+1·71	+26 56 59·4	+ 2·2	*c*
Paris Catalogue, 10415	8 23 12·68	+1·84	+20 47 16·2	− 0·2	*d*
Ast. Nach., No. 3128, p. 130	19 47 6·60	+1·52	+10 4 30·9	+ 8·9	*e*
M_1 23665	20 10 21·11	+1·58	+ 7 28 44·2	+ 9·2	*f*
Lund Zones, No. 330	0 44 5·98	+2·96	+38 9 3·7	+26·2	*g*
Paris Catalogue, 1102	0 46 56·59	+2·94	+37 57 43·5	+26·4	*h*
Lund Zones	0 43 38·28	+2·92	+37 36 57·0	+26·7	*i*
Lund Zones, No. 335	0 41 47·88	+2·86	+37 2 29·6	+27·1	*j*
Lund Zones, No. 73, 94	0 39 18·46	+2·74	+36 47 31·3	+28·3	*l*
Leiden Zones, No. 235	0 47 50·53	+2·72	+35 8 46·0	+28·2	*m*
Leiden Zones, No. 324	0 42 6·70	+2·65	+35 8 55·0	+28·1	*n*
Leiden Zones, No. 324	0 50 19·46	+2·65	+34 38 35·0	+28·0	*o*
$W_2 0^h$ No. 1279	0 51 56·78	+2·64	+34 46 47·9	+28·0	*p*
Leiden Zones, No. 343	1 24 48·24	−0·86	+33 37 18·0	+ 8·2	*q*
Leiden Zones, No. 903	1 34 16·76	−0·92	+33 47 55·1	+ 8·1	*r*
Leiden Zones, No. 396	1 52 44·43	−0·95	+33 49 10·6	+ 8·2	*s*
Leiden Zones, No. 239	2 7 41·50	−1·03	+34 7 16·7	+ 7·9	*t*
Paris Observations, 1882	2 7 36·87	−1·02	+34 0 52·0	+ 7·7	*u*
Romberg, 6099	13 3 6·04	+1·29	+16 4 13·4	−15·5	*v*
$Armagh_2$, No. 1553	13 14 59·61	+1·34	+18 20 8·3	−17·9	*x*
W. B., xiii. No. 1120	13 52 23·77	+1·41	+32 37 4·1	−25·3	*y*
Hels. Zones, 86, 87	15 30 38·89	−0·07	+55 39 42·1	−28·0	*z*
O. A., No. 15423	15 26 9·28	0·00	+55 33 59·1	−28·3	*aa*

Liverpool Observatory:
1893 *April* 13.

Galactic Longitudes and Latitudes of the brighter Stars in a Zone of the Heavens containing the Milky Way. By A. Marth.

(*Continued from page* 109.)

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °
°	°	m	m						
180·03	− 9·04	5·6	6·2		Monocerotis	6	8	41	− 4 32·1
180·25	+ 1·45	...	cum.		,,	8m·5 6	45	31	+ 0 30·6
180·45	− 9·02	6·0	6·3		,,	6	9	35	− 4 52·6
180·53	−24·60	5·2	5·7	7	ν Leporis	5	14	25	−12 26·4
180·63	+ 7·73	5·5	5·9		Monocerotis, Canis min.	7	8	3	+ 3 18·9
180·67	−12·34	5·0	5·8		Orionis, Monocerotis	5	58	24	− 6 42·3
181·31	− 0·11	...	6·2		Monocerotis	6	42	14	− 1 11·2
181·33	−25·07	4·3	4·1	6	λ Leporis	5	14	3	−13 18·1
181·38	−17·33	2·2	2·3	53	κ Orionis	5	42	4	− 9 42·8
181·46	−10·60	5·0	5·9		Monocerotis	6	6	1	− 6 31·5
181·58	− 9·81	4·0	4·3	5	,,	6	9	0	− 6 14·4
181·81	+14·23	0·5	1·2	10	α Can. min. (Procyon)	7	33	1	+ 5 31·9
181·83	− 6·23	5·0	5·4	10	Monocerotis	6	22	2	− 4 41·4
181·89	+ 1·31	5·2	5·9		,,	6	48	19	− 0 58·7
182·08	−20·61	6·0	6·5		Orionis, Leporis	6	31	33	−11 51·0
182·26	− 1·37	...	6·1		Monocerotis	6	43	14	− 2 8·3
182·54	−24·55	5·1	5·7	8	Leporis	5	18	1	−14 2·5
182·63	−14·81	5·1	5·7	2	Monocerotis	5	53	23	− 9 34·1
182·80	+11·92	5·6	6·2	8	δ_2 Canis minoris	7	26	54	+ 3 32·7
182·82	+24·20	3·8	3·5	17	β Cancri	8	10	0	+ 9 33·2
183·26	+ 5·41	...	6·0	21	Monocerotis	7	5	16	− 0 6·3
183·28	− 4·57	5·2	5·9		,,	6	30	41	− 5 6·8
183·34	− 5·80	5·7	6·0		,,	6	26	31	− 5 46·9
183·49	+ 5·42	4·0	4·6	22	,,	7	5	44	− 0 17·7
183·54	− 9·50	5·1	5·9	7	,,	6	13	56	− 7 46·4
183·89	+11·01	5·1	5·9	7	δ_1 Canis minoris	7	25	52	+ 2 10·4
183·91	−14·70	4·8	5·6	3	Monocerotis	5	56	12	−10 36·0
183·93	− 7·14	3·9	4·1 tr.	11	,,	6	23	0	− 6 57·4
184·01	−13·75	5·9	6·4		,,	5	59	47	−10 14·2
184·84	−10·43	5·7	6·0		,,	6	13	8	− 9 20·6
184·92	+18·80	5·6	6·0		Canis minoris	7	54	53	+ 5 12·5
185·29	− 7·03	5·6	6·0		Monocerotis	6	26	4	− 8 4·4
185·64	+ 1·63	4·8	5·5	19	,,	6	56	57	− 4 4·0

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h m s	δ 1880. ° ′
186·10	−19·12	5·6	5·8		Leporis	5 44 10	−14 31·2
186·12	−19·85	3·7	3·6	14 ζ	,,	5 41 31	−14 52·1
186·52	+15·19	5·0	5·7	13 ζ	Canis minoris	7 45 29	+ 2 4·3
186·55	+ 3·21	5·1	5·4	20	Monocerotis	7 4 16	− 4 3·1
186·58	−17·51	3·7	3·8	16 η	Leporis	5 50 56	−14 11·5
186·73	+ 1·35	...	6·2		Monocerotis	6 58 11	− 5 8·9
186·81	+ 0·68	5·4	5·6		,,	6 56 3	− 5 33·1
186·90	+ 8·50	5·7	6·0		,,	7 23 15	− 1 39·6
186·97	+16·86	5·3	6·0	14	Canis minoris	7 52 7	+ 2 32·6
187·28	−11·00	5·3	6·1		Monocerotis, Canis	6 15 49	−11 43·2
187·38	−10·29	5·5	5·6		,, ,,	6 18 34	−11 28·0
187·39	− 5·33	5·4	5·7		,,	6 36 13	− 9 3·2
187·39	+17·76	4·6	4·9	1 Hev.	Canis minoris	7 56 1	+ 2 39·8
187·45	−24·22	2·7	2·7	11 α	Leporis	5 27 26	−17 54·6
187·46	− 2·28	6·1	6·6		Monocerotis	6 44 56	− 7 54·1
187·93	− 4·02	5·3	5·6		,,	6 41 53	− 8 52·1
188·39	−13·13	4·8	5·5		Canis	6 10 15	−13 40·8
188·41	−15·75	4·6	5·2	18 θ	Leporis	6 0 43	−14 55·5
188·47	−14·86	5·7	6·0		,,	6 4 8	−14 33·9
188·78	− 4·76	5·5	6·1		Canis, Monocerotis	6 40 58	− 9 58·8
188·96	− 0·97	...	6·2		Monocerotis	6 54 38	− 8 14·4
189·00	− 9·15	5·3	5·6		Canis	6 25 49	−12 18·5
189·29	− 0·49	...	cum.		Monocerotis $7^{m}\cdot7$	6 57 0	− 8 16·8
189·33	−22·24	6·0	6·0		Leporis	5 38 7	−18 36·8
189·58	+ 4·97	5·8	6·2		Monocerotis	7 16 32	− 5 45·3
189·72	−16·70	4·9	5·5	17	Leporis	5 59 38	−16 28·7
189·84	+ 9·11	5·1	5·7	25	Monocerotis	7 31 19	− 3 50·7
190·59	+15·63	4·9	5·2	28	,,	7 55 7	− 1 3·7
191·08	−14·37	5·9	6·5		Canis	6 10 47	−16 34·7
191·37	− 4·08	4·2	4·4	14 θ	,,	6 48 37	−11 53·4
191·44	−14·13	5·1	5·8		,,	6 12 21	−16 46·3
191·48	− 8·28	5 0	5·3		,,	6 33 48	−14 2·4
192·23	− 1·06	5·1	6·0		,,	7 1 3	−11 6·6
192·34	+ 1·09	5·9	6·3		Monocerotis	7 8 47	−10 6·7
192·42	+14·13	5·1	5·6	27	,,	7 53 44	− 3 21·2
192·53	−17·30	5·5	5·9	19	Leporis	6 2 28	−19 9·2
192·61	− 6·80	4·9	5·5	11	Canis	6 41 23	−14 17·9
192·84	− 7·16	5·3	5·7		,,	6 40 32	−14 40·2

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′	″
192·98	−21·49	4·0	3·7	15 δ	Leporis	5	46	10	−20	53	6
193·00	+16·38	4·5	4·9	29	Monocerotis	8	2	34	− 2	38	1
193·02	+11·75	5·7	6·4		,,	7	46	52	− 5	7	2
193·04	−13·58	2·0	2·2	2 β	Canis	6	17	25	−17	53	9
193·29	+ 9·61	5·9	6·1		Monocerotis	7	40	10	− 6	28	7
193·29	−23·59	3·8	3·5	13 θ	Leporis	5	39	28	−22	29	3
193·36	− 4·65	5·2	5·5	18 μ	Canis	6	50	37	−13	53	4
193·49	− 6·70	5·3	5·8		,,	6	43	31	−15	0	6
193·92	+ 4·82	var.	5·9−8·0	U	Monocerotis	7	25	4	− 9	31	6
194·21	+ 4·24	...	6·2		,,	7	23	40	−10	4	8
194·40	−15·41	5·1	5·8		Canis	6	13	3	−19	54	7
194·42	− 8·22	−1·4	0·1	α	,, (Sirius)	6	39	52	−16	33	2
194·98	−10·49	4·7	4·9	8 ν_3	,,	6	32	37	−18	8	1
195·06	+ 7·16	4·2	4·0	26	Monocerotis	7	35	31	− 9	16	3
195·08	+ 3·29	5·8	6·3		,, , Canis	7	22	13	−11	18	9
195·20	−11·01	...	6·4	6 ν_1	Canis	6	31	8	−18	33	8
195·39	−15·68	5·4	6·2		,,	6	13	51	−20	52	6
195·65	− 3·81	4·1	4·5	23 γ	,,	6	58	20	−15	27	4
195·76	−18·43	5·5	5·8		Leporis	6	3	55	−22	24	4
195·77	−11·22	4·2	4·1	7 ν_2	Canis	6	31	27	−19	9	3
195·87	+22·19	5·6	6·4		Monocerotis, Hydræ	8	27	57	− 1	44	6
195·92	+ 9·21	5·8	6·2		,,	7	44	25	− 8	52	9
195·93	+19·34	...	6·2		,, , 1 Hydræ	8	18	36	− 3	21	8
196·01	− 6·11	4·5	4·9	20 ι	Canis	6	50	47	−16	54	0
196·08	+15·39				8m	8	5	39	− 5	39	7
196·15	+15·96	cum. VI 22			Monoc., Hydræ 8m·5	8	7	45	− 5	24	8
196·36	+16·02				8m	8	8	22	− 5	32	3
196·16	−18·40	5·7	5·9		Leporis	6	4	46	−22	44	3
196·17	−19·22	5·4	5·8		,, 6m	6	1	32	−23	5	9
...	...				,, 7m	6	1	51	−23	4	9
196·22	+19·48	3·9	3·8	30	Monocerotis, C Hydræ	8	19	40	− 3	31	0
196·41	+19·60	...	6·2		,, , 2 ,,	8	20	28	− 3	35	6
196·87	− 2·90	6·0	6·6		Canis	7	4	9	−16	2	5
197·11	− 1·18	5·2	5·9		,,	7	10	48	−15	22	5
197·44	− 7·64	5·5	6·1		,,	6	48	4	−18	53	2
197·61	+14·43	5·3	5·7		Monocerotis, Hydræ	8	5	43	− 7	25	0
198·17	+12·57	5·8	6·5		,,	8	0	41	− 8	54	1
198·17	− 9·99	cum. neb. Mess. 14			Canis 7m·6	6	40	48	−20	39	0

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.		α 1880. h m s	δ 1880. ° ′
198·20	− 0·93	var.	5·9–6·7		R Canis		7 14 2	−16 10·3
198·21	+ 7·15	5·4	5·9	5	Puppis		7 42 20	−11 54·0
198·35	+ 3·01	5·0	5·2		,,		7 28 17	−14 15·9
198·52	− 8·16	4·4	5·3	15	Canis		6 48 22	−20 4·6
198·63	+ 3·48	cum. VIII. 38			Puppis	$6^{m}\cdot0$	7 30 33	−14 13·7
198·69	+ 3·61				,,	$7^{m}\cdot0$	7 31 5	−14 13·0
198·67	+ 0·25	4·9	6·0		Canis		7 19 15	−15 58·0
198·68	− 7·69	4·4	4·9	19	π ,,		6 50 25	−19 59·1
198·85	− 7·94	5·9	6·5	17	,,		6 49 52	−20 15·2
198·94	−21·19	5·0	5·5		Columbæ, Leporis		5 58 25	−26 17·1
198·98	−13·24	4·4	4·8	5	ξ_2 Canis		6 30 2	−22 52·2
199·06	−14·10	4·2	4·5	4	ξ_1 ,,		6 26 51	−23 20·0
199·77	+ 6·16	5·2	5·5	4	Puppis		7 40 25	−14 16·4
199·84	+ 3·97	5·2	5·4		,,		7 34 54	−14 59·2
199·89	−19·63	5·9	6·4		Columbæ, Leporis		6 6 25	−26 27·4
199·97	−20·01	6·0	6·6		,, ,,		6 4 59	−26 40·8
200·13	−12·64	5·8	6·6		Canis		6 34 37	−23 35·3
200·15	+ 7·03	5·5	5·7	9	Puppis		7 46 13	−13 34·9
200·27	−16·66	5·8	6·0		Canis		6 19 3	−25 30·8
200·40	− 0·10	5·6	6·2		,,		7 21 47	−17 37·5
200·49	−20·03	5·8	6·0		Columbæ, Leporis		6 5 48	−27 7·7
200·80	− 1·69	4·9	5·7		Canis		7 16 56	−18 47·4
200·85	−16·11	6·0	6·5		,,		6 22 21	−25 46·6
201·03	+ 6·62	5·6	6·1	10	Puppis		7 46 47	−14 32·3
201·04	− 9·35	5·2	5·9		Canis		6 50 44	−22 47·2
201·17	− 4·77	5·6	6·3		,,		7 6 31	−20 41·1
201·25	+19·22	5·7	6·1		Monocerotis, 3 Hydræ		8 29 37	− 7 34·2
201·55	−10·75	6·2	6·6 cum.		Canis		6 44 45	−23 56·3
201·85	+21·31	4·8	4·9	31	Monocerotis, F Hydræ		8 37 47	− 6 48·2
201·90	− 9·77	6·4	7·2		Canis		6 49 13	−23 46·7
201·97	+11·52	4·6	5·2	19	Puppis		8 5 38	−12 34·3
202·12	− 9·91	4·0	3·9	16	o_1 Canis		6 49 9	−24 2·1
202·48	+ 0·35	...	6·2		Puppis		7 28 2	−19 9·2
202·63	+10·92	...	6·0	18	,,		8 5 6	−13 26·8
202·69	+13·13	6·0	6·5		,,		8 12 42	−12 13·6
202·70	+ 4·80	5·7	5·7	6	,,		7 44 16	−16 55·4
202·78	− 7·96	3·0	3·4	24	o_2 Canis		6 58 1	−23 39·6
202·90	− 9·43	5·2	5·9		,,		6 52 37	−24 28·5

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′
°	°	m	m							
203·01	−16·20	5·7	6·1		Canis	6	26	1	−27	41·2
203·15	+ 0·88	...	6·2		Puppis	7	31	25	−19	26·2
203·38	−15·85	5·7?	8·5		Canis 8m·5	6	28	11	−27	51·1
203·70	− 9·60	5·4	6·0		,,	6	53	41	−25	15·2
203·80	− 9·00	6·0	6·0		,,	6	56	10	−25	2·8
203·84	+14·84	5·8	5·9		Puppis, Monocerotis	8	21	2	−12	8·5
204·22	−19·24	3·0	3·2	1 ζ	Canis	6	15	42	−30	0·7
204·52	+ 9·29	...	6·0		Puppis	8	3	59	−15	53·8
204·67	+10·32	5·1	5·7	20	,,	8	7	49	−15	25·7
204·87	− 2·81	5·4	5·7		Canis	7	21	54	−22	50·6
204·93	+ 6·06	4·6	5·2		Puppis	7	54	29	−18	4·3
205·04	− 1·01	4·5	5·2		,,	7	28	55	−22	2·3
205·15	− 2·21	4·8	5·7		,,	7	24	46	−22	46·6
205·18	− 5·20	4·8	5·6	29	Canis	7	13	41	−24	20·5
205·52	− 5·39	4·3	4·6	30	,,	7	13	44	−24	44·2
205·63	− 8·11	1·8	2·1	25 δ	,,	7	3	31	−26	12·2
205·74	+13·29	6·0	6·3		Puppis	8	20	21	−14	32·4
205·78	+17·51	5·2	5·4	6	Hydræ	8	34	20	−12	3·1
206·07	− 1·57	5·2	5·7 *d*	*n*	Puppis	7	29	15	−23	12·8
206·24	− 6·96	4·5	5·4	27	Canis	7	9	22	−26	8·8
206·28	+ 3·06	...	6·2		Puppis	7	46	29	−20	52·1
206·30	−10·16	3·5	3·6	22 σ	Canis	6	56	56	−27	45·8
206·41	−15·58	5·8	5·9		,,	6	35	7	−30	21·4
206·67	− 7·05	3·7	4·2	28 ω	,,	7	9	56	−26	33·9
206·82	− 8·28	5·4	6·3		,,	7	5	30	−27	17·8
206·92	−11·24	1·5	1·8	21 ε	,,	6	53	55	−28	48·6
206·95	+ 7·51	4·2	5·1	16	Puppis	8	3	40	−18	53·7
206·96	− 6·17	5·4	6·0		Canis	7	13	58	−26	22·0
206·99	− 2·44	5·6	6·7		Puppis	7	28	9	−24	27·2
207·24	−17·61	5·7	6·0 *d*		Canis	6	28	9	−31	56·5
207·37	−18·37	4·1	4·7	λ	,,	6	23	43	−32	30·3
207·37	+10 96	5·9	5·9		Puppis	8	16	28	−17	12·3
207·44	−14·92	5·2	5·7	10	Canis	6	39	54	−30	56·9
07·50	+ 0·22	...	cum. Mess. 93		Puppis 8m	7	39	13	−23	26·2
207·66	+18·09	4·4	4·4	12	Hydræ	8	40	42	−13	6·6
207·68	−20·20	4·1	3·9	δ	Columbæ, 3 Canis	6	17	44	−33	22·6
207·80	+ 6·43	5·1	5·9		Puppis	8	2	0	−20	12·5
207·84	− 7·25	4·9	5·4		Canis	7	11	46	- 27	40·2

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′
208·00	−16·75	...	5·7		Canis	6	33	18	−32	14·3
208·07	−17·51	5·3	6·1		,,	6	30	8	−32	37·4
208·16	− 1·79	4·3	5·4	*m*	Puppis	7	33	18	−25	5·6
208·25	−20·76	...	6·0		Columbæ	6	16	16	−34	5·5
208·33	− 0·22	5·4	6·4		Puppis	7	39	31	−24	23·4
208·57	− 5·90	...	6·1		Canis	7	18	39	−27	36·2
208·66	+ 3·11	4·3	4·9	11	Puppis	7	51	42	−22	33·7
208·86	− 4·99	4·7	5·0 *d*		Canis	7	11	33	−23	6·2
208·92	−21·90	...	4·8	*κ*	Columbæ	6	12	17	−35	6·1
208·92	+15·74	5·0	5·3	*q*	Hydræ	8	36	9	−15	30·8
209·01	+ 3·30	5·2	5·9	12	Puppis	7	53	57	−22	59·1
209·07	+ 0·58	3·4	3·5	7 *ξ*	,, , *ξ* Argus	7	44	15	−24	33·6
209·29	−14·51	3·9	4·0	13 *κ*	Canis	6	45	21	−32	22·2
209·39	+ 9·46	5·4	6·0		Puppis	8	16	22	−19	41·7
209·45	− 2·45	3·9	4·0 *d*	*k*	,,	7	33	55	−26	31·9
209·53	− 1·46	5·8	6·5		,,	7	37	51	−26	4·0
209·83	+ 0·23	4·7	5·3	o	,,	7	43	6	−25	38·4
209·91	− 6·52	2·4	2·9	31 *η*	Canis	7	19	21	−29	4·2
210·19	− 8·85	...	6·1		,,	7	10	43	−30	28·7
210·37	− 3·92	4·4	5·3	*p*	Puppis	7	30	34	−28	6·3
...	...	...	7·7 } 5·6		Monocerotis, Pyxidis	8	26	0	−19	6·1
210·38	+11·60	5·4	5·7 }		,, ,,	8	26	7	−19	10·4
210·93	+ 4·32	2·9	3·2	15	Puppis, *ρ* Argus	8	2	26	−23	57·6
211·11	−15·12	...	5·4		,,	6	46	30	−34	13·6
211·36	− 2·42	5·0	5·0	1	,,	7	38	42	−28	7·6
211·41	−19·06	...	5·9		Columbæ	6	29	37	−36	8·6
211·53	+ 7·54	5·8	6·0		Puppis	8	15	14	−22	32·8
211·58	−13·61	...	5·4	*t*	,,	6	54	2	−33	57·0
211·75	+18·81	5·9	6·4		Hydræ	8	53	6	−15	40·8
211·85	− 2·66	4·2	4·2	3 *l*	Puppis	7	38	59	−28	40·1
212·07	−18·98	...	6·1		Columbæ	6	31	14	−36	41·0
212·08	− 8·03	5·4	5·9		Puppis, Canis	7	18	25	−31	41·6
212·08	− 6·13	4·6	5·3		,,	7	26	3	−30	42·7
212·17	− 7·66	...	5·6		Canis	7	20	8	−31	34·4
212·34	+ 8·22	5·5	5·9		Puppis	8	19	42	−22	46·0
212·39	− 8·07	...	5·8		Canis	7	18	59	−31	58·3
212·71	−19·89	...	5·8		Columbæ	6	28	15	−37	36·4
212·94	−15·76	...	6·2		Puppis	6	47	29	−36	5·1

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′	″
213·08	+ 7·71	5·5	5·8		Puppis	8	19	53	−23	39	5
213·81	− 4·64	var.	6·5−7·5	R	„	7	36	13	−31	23	0
213·99	+ 11·11	5·1	5·6		Pyxidis	8	33	53	−22	15	3
214·14	− 17·32	...	5·3	x	Puppis	6	43	15	−37	47	9
214·63	+ 5·92	5·7	6·5		„	8	17	46	−25	57	9
214·65	+ 8·82	5·9	6·4		Pyxidis, Mali	8	27	54	−24	11	9
214·66	− 0·89	4·8	5·5		Puppis	7	52	53	−30	0	8
215·20	+ 19·28	...	6·2		Hydræ	9	3	32	−17	49	4
215·60	− 11·41	...	5·6		Puppis	7	12	33	−36	22	7
215·87	− 11·22	...	5·3	ν_1	„	7	14	2	−36	31	0
...	...	...	5·4	ν_2	„	7	14	22	−36	31	4
216·09	− 11·59	...	2·7	π	„ , π Argus	7	12	54	−36	53	0
216·26	− 6·99	...	4·8	f	„	7	32	56	−34	42	0
216·53	− 5·15	...	6·0		„	7	41	7	−33	56	3
216·64	+ 8·64	5·0	5·6	η	Pyxidis, g Mali	8	32	45	−25	50	1
216·76	+ 7·85	5·7	6·5		„ „	8	30	23	−26	25	8
216·82	+ 18·83	5·7	6·4		Hydræ	9	6	29	−19	15	5
217·08	− 8·30	...	6·0	Z	Puppis	7	29	31	−36	4	7
217·11	+ 10·58	5·8	6·5		Pyxidis, Mali	8	40	38	−24	57	1
217·38	− 1·05	...	5·8		Puppis	7	59	36	−32	20	2
217·65	− 14·21	...	5·3	A	„	7	4	49	−39	27	8
217·68	− 4·26	...	5·7		„	7	47	47	−34	24	3
217·73	− 7·54	...	6·3		„	7	34	23	−36	13	4
217·83	− 6·51	...	6·2		„	7	39	0	−35	45	9
217·93	− 6·38	...	6·2		„	7	39	47	−35	46	7
218·13	− 12·34	...	5·8	F	„	7	14	28	−38	59	5
218·57	− 20·97	...	3·5	ν	„	6	34	5	−43	5	5
218·65	− 15·06	...	6·2		„	7	3	11	−40	42	4
218·73	− 14·01	...	5·7	E	„	7	8	17	−40	17	8
218·77	− 10·36	...	5·9	y	„	7	24	55	−38	33	9
218·87	− 4·57	...	6·1		„	7	49	44	−35	33	8
219·15	− 5·03	...	6·0		„	7	48	39	−36	3	2
219·36	− 8·35	...	5·4	d_1	„	7	35	14	−38	1	8
219·48	+ 6·87	4·9	5·4	ζ	Pyxidis, f Mali	8	34	44	−29	8	1
219·61	+ 9·88	4·3	4·4	γ	„ c „	8	45	26	−27	15	9
219·67	− 7·20	...	3·6 cum	c	Puppis	7	40	59	−37	40	7
219·74	− 16·20	...	5·5	C	„	7	0	14	−42	9	6
219·75	− 8·17	...	6·2		„	7	37	3	−38	15	2

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
219·80	+ 1·63	...	5·7	*w* Puppis	8	16	39	−32	40·4
220·26	+ 3·70	...	6·1	Pyxidis, Mali	8	25	40	−31	45·4
220·27	+ 9·26	5·8	6·4	„ „	8	45	18	−28	10·2
220·31	+ 10·73	4·8	5·4	δ „ *d* „	8	50	23	−27	13·2
220·36	− 7·12	...	5·9	Puppis	7	43	10	−38	12·9
220·86	+ 14·02	4·8	4·9	κ Pyxidis, Mali	9	2	47	−25	22·5
220·87	+ 8·65	5·9	6·5	„ „	8	45	0	−29	1·0
220·95	− 16·75	...	5·8*d*	Puppis	7	0	17	−43	26·5
221·12	− 1·37	...	5·3	*r* „	8	8	58	−35	32·3
221·22	− 6·46	...	4·9	*b* „	7	48	24	−38	33·2
221·33	− 0·31	...	6·2	„	8	13	42	−35	4·7
221·41	+ 19·62	5·0	5·1	G Hydræ	9	21	49	−21	49·1
221·48	+ 21·41	5·2	5·9	„	9	27	41	−20	35·1
221·51	− 1·54	...	5·9 } 5·4	Puppis	8	9	28	−35	57·6
...	...	...	7·0 }	„	8	9	28	−35	58·7
222·06	− 9·01	...	5·7	„	7	39	37	−40	38·5
222·27	− 8·15	var.	6·5−7·2	T „	7	44	2	−40	21·2
222·31	− 5·59	...	5·9	„	7	55	14	−38	58·1
222·34	− 1·00	...	4·7	*q* „	8	14	4	−36	17·3
222·53	− 0·44	...	5·9	„	8	16	49	−36	6·2
222·62	− 7·45	...	4·0	*a* „	7	48	6	−40	16·0
222·68	− 15·65	var.	3·5−6·3	L_2 „	7	9	53	−44	26·7
222·81	− 12·52	...	3·5	σ „ , σ Argus	7	25	25	−43	3·5
222·82	− 20·22	...	5·4	„	6	46	31	−46	29·3
222·82	+ 5·18	...	3·8	α Pyxidis, *a* Mali	8	38	46	−32	45·3
222·89	+ 20·24	5·8	6·3	Hydræ	9	27	58	−22	20·3
223·12	+ 16·12	4·9	5·2	θ Pyxidis, *h* Mali	9	16	11	−25	27·3
223·15	− 15·93	...	5·3	L_1 Puppis	7	9	38	−44	58·5
223·35	− 5·33	...	2·5	ζ „ , ζ Argus	7	59	22	−39	39·9
223·37	+ 6·44	...	5·8	Pyxidis, Mali	8	44	59	−32	20·0
223·71	− 22·57	...	5·3*d*	Puppis	6	35	26	−48	6·8
223·89	− 3·89	...	4·8	h_1 „	8	7	4	−39	15·7
223·97	− 3·26	...	4·4	β Pyxidis, *b* Mali	8	35	24	−34	53·0
224·34	− 6·20	...	6·2	Puppis	7	58	37	−40	58·5
224·50	+ 11·22	5·4	6·0	ε Pyxidis, *e* Mali	9	4	51	−29	52·6
224·59	− 16·72	...	4·8	I Puppis	7	9	8	−46	33·6
224·78	− 3·89	...	4·8	h_2 „	8	9	47	−39	58·9
224·82	+ 20·94	4·6	5·2	Hydræ	9	35	49	−23	2·8

Galactic Long.	Lat.	Magn. H.P.	U.A.	Star.	α 1880. h m s	δ ° ′
		m	m			
224·84	−16·41	...	6·2	Puppis	7 11 19	−46 38·4
224·89	−16·15	...	6·1	,,	7 12 48	−46 33·7
224·98	+16·99	5·7	6·0	Antliæ	9 24 35	−26 3·9
225·24	+20·85	4·9	5·4	Hydræ	9 36 49	−23 22·6
225·28	+19·02	6·0	6·4	,,	9 31 36	−24 45 6
225·31	−24·56	...	5·5	Puppis	6 26 52	−50 9·3
225·32	−20·01	...	5·5	,,	6 53 4	−48 33·8
225·48	+14·34	4·9	5·3	λ Pyxidis, Mali	9 18 1	−28 19·3
225·59	− 8·30	...	6 } 5·9	Puppis	7 53 2	−43 10·8
...	...	...	7·2 }	,,	7 53 12	−43 9·7
225·68	−11·29	...	5·6	,,	7 39 14	−44 52·1
226·03	+14·91	6·0	6·5	Pyxidis, Mali	9 21 31	−28 16·1
226·14	− 8·58	...	5·7	N Puppis	7 53 25	−43 47·3
226·17	−17·04	...	5·0	,,	7 11 19	−48 3·8
226·53	−17·90	...	5·6	,,	7 7 34	−48 44·4
226·65	− 5·83	...	5·3	,,	8 7 23	−42 37·8
226·68	−19·19	...	5·3	H ,,	7 0 46	−49 24·6
226·81	−21·65	...	3·2	τ ,, , τ Argus	6 46 57	−50 28·3
226·84	+15·86	var.	6·7−7·3	S Antliæ	9 27 3	−28 6·0
227·24	− 9·58	...	5·6	O Puppis	7 54 5	−45 15·3
227·32	−10·98	...	4·3	P ,,	7 45 35	−46 4·3
227·36	−11·36	...	5·9	,,	7 43 54	−46 18·7
227·39	− 6·75	...	5·9	Velorum	8 5 38	−43 46·2
227·56	− 3·20	...	6·0	Puppis	8 21 40	−41 45·7
227·64	−26·12	...	0·4	α Argus (Canopus)	6 21 17	−52 37·8
227·80	+ 0·11	...	6·0	Velorum	8 35 55	−39 50·3
227·84	−11·47	...	5·1	Q Puppis	7 44 46	−46 46·5
228·04	− 7·83	...	5·7	Velorum, Puppis	8 2 49	−44 55·2
228·26	−20·33	...	5·8	Carinæ	6 57 57	−51 13·9
228·29	+18·25	4·9	5·1	θ Antliæ	9 38 51	−27 13·3
228·33	−13·70	...	6·0	Puppis	7 34 55	−48 19·7
228·41	−14·04	...	6·1	,,	7 33 22	−48 33·7
228·45	−24·59	...	4·8	N Carinæ	6 32 20	−52 52·7
228·84	+21·09	5·1	5·3	Hydræ	9 48 46	−25 22·1
228·86	+13·23	...	6·1 *d*	ζ_1 Antliæ	9 25 38	−31 21·7
228·97	+13·36	...	6·3	ζ_2 ,,	9 26 24	−31 20·6
229·00	+ 1·42	...	6·2	*h* Velorum	8 45 11	−39 52·4
229·18	−11·29	...	4·5	J Puppis	7 49 46	−47 47·4

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′	″
229·57	− 2·02	...	4·6	*e* Velorum	8	33	26	−42	34	2
229·62	−16·53	...	5·7	Carinæ	7	23	17	−50	46	6
229·86	−22·68	...	4 8	A „	6	47	15	−53	29	0
230·00	− 4·26	...	5·5*d*	Velorum	8	25	25	−44	19	4
230·05	− 8·61	...	3 cum.	γ „ , γ Argus	8	5	50	−46	59	0
30·10	+13·92	...	6·2	Antliæ	9	32	0	−31	38	4
230·11	− 0·86	...	4·4	*d* Velorum	8	40	7	−42	12	9
230·16	− 7·83	...	5·8	„	8	9	51	−46	37	7
230·22	−17·80	...	5·9	Carinæ	7	17	43	−51	51	6
230·31	− 0·50	...	cum.	Velorum $7^{m}\cdot5$	8	42	15	−42	7	6
230·42	− 0·20	...	cum.	„ $6^{m}\cdot9$	8	43	49	−42	1	3
230·42	+ 7·10	...	5·1	*k* „	9	10	57	−36	54	8
230·48	−12·13	...	5·0	Puppis, Velorum	7	49	41	−49	18	1
230·57	− 8·91	...	5·9	Velorum	8	6	4	−47	35	2
230·61	−11·21	var.	4·4 − 5·2	Puppis, Velorum	7	54	47	−48	55	2
231·03	+ 2·23	...	5·2	*w* Velorum	8	55	37	−40	47	2
231·14	− 9·41	...	6·2	„	8	5	35	−48	19	9
231·21	+ 6·25	...	5·5	*l* „	9	10	53	−38	4	2
231·33	−11·47	...	6·2 *d*	Puppis, Velorum	7	55	49	−49	39	0
231·41	+10·01	...	5·0	ϵ Antliæ	9	24	18	−35	25	6
231·63	+ 1·99	...	6·2	Velorum	8	56	53	−41	23	6
231·86	−15·23	...	5·5	Q Carinæ	7	32	42	−52	16	0
231·93	− 2·99	...	5·9	Velorum	8	37	52	−44	58	9
231·98	+ 5·83	...	5·8	„	9	12	15	−38	53	9
232·28	− 7·50	...	5·4	B „	8	18	50	−48	6	3
232·49	− 6·29	...	6·0	A „	8	25	17	−47	31	7
232·73	− 3·96	...	4·1	*h* „	8	36	39	−46	13	3
232·76	− 1·88	...	5·7	*g* „	8	45	39	−44	51	7
232·81	− 9·68	...	6·0	„	8	10	6	−49	49	9
232·83	− 2·71	...	6·2	„	8	42	25	−45	28	4
232·87	− 2·86	...	4·1	*o* „	8	41	57	−45	36	2
233·18	− 4·20	...	5·2	*n* „	8	37	17	−46	53	4
233·62	+ 1·78	...	2·5	λ „ λ Argus	9	3	35	−42	56	9
233·73	−13·38	...	3·7	χ Carinæ, χ „	7	53	44	−52	39	7
233·76	− 2·59	...	5·6	*f* Velorum	8	46	29	−46	4	9
233·80	−21·80	...	5·7	Carinæ	7	2	4	−56	34	1
233·95	− 4·77	...	5·9 neb.	Velorum	8	38	23	−47	40	1
234·30	+ 2·74	...	5·9	*z* „	9	9	56	−42	43	9

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880 h	m	s	δ 1880 °	′
234·63	−14·64	...	6·1	Carinæ	7	49	38	−54	3·4
234·67	+ 6·83	...	3·7	ψ Velorum, ψ Argus	9	25	58	−39	56·5
234·87	− 2·84	...	5·8	,,	8	49	49	−47	3·9
235·01	+ 6·89	...	6·0	,,	9	27	33	−40	7·1
235·02	+ 1·15	...	5·6	,,	9	6	43	−44	22·6
235·08	− 6·31	...	5·6	C ,,	8	31	4	−49	31·9
235·19	− 9·05	...	5·7	,,	8	22	6	−51	20·1
235·24	− 2·02	...	5·9	,,	8	54	48	−46	46·2
235·28	+ 2·24	...	5·6	,,	9	11	57	−43	45·9
235·37	+21·84	5·5	5·8	Hydræ, Antliæ	10	12	38	−28	23·5
235·49	− 5·62	...	5·8	D Velorum	8	39	55	−49	23·4
235·58	− 7·31	...	6·4	,,	8	32	17	−50	33·2
235·76	− 1·27	...	4·6	c ,,	9	0	1	−46	37·2
236·11	+13·87	...	5·6	η Antliæ	9	53	43	−35	19·0
236·21	−22·77	...	6·0d	Carinæ	7	1	25	−59	0·0
236·22	−16·07	...	5·9	,,	7	46	32	−56	6·5
236·28	− 0·01	...	6·2	Velorum	9	7	19	−46	5·6
236·49	− 9·61	...	5·7	F ,,	8	24	19	−52	41·5
237·43	−15·82	...	6·1	Carinæ	7	52	24	−56	59·2
237·45	−13·47	...	6·0	,,	8	6	46	−55	43·9
237·48	+ 5·64	...	6·0	y Velorum	9	33	20	−42	39·0
237·55	− 8·01	...	4·0 cum.	o ,, ,o Argus	8	36	51	−52	29·8
237·62	− 8·13	...	6·1	,,	8	36	32	−52	37·8
237·87	− 8·48	...	6·2	,,	8	36	1	−53	1·0
...	...	...	6·6	,,	8	38	53	−52	40·2
237·90	−78·89	...	6·3 (5·7)	,,	8	38	59	−52	41·1
238·35	+21·17	4·5	4·4	α Antliæ	10	31	40	−30	27·4
238·50	−25·36	...	3·5	α Pictoris	6	46	58	−61	48·8
238·99	− 6·05	...	5·4	H Velorum	8	52	42	−52	15·8
239·03	+13·63	var.	6·5−8	R Antliæ	10	4	35	−37	8·6
239·17	− 5·08	...	5·9	Velorum	8	58	1	−51	43·0
239·35	− 8·78	...	2·2	δ ,, ,δ Argus	8	41	23	−54	16·2
239·66	+ 5·39	...	6·0	,,	9	41	50	−44	12·0
239·78	−17·92	...	6·2	Carinæ	7	47	14	−59	59·1
240·16	− 2·49	...	5·8	K Velorum	9	14	6	−50	32·8
240·33	−17·02	...	6·1	Carinæ	7	55	34	−59	58·9
240·66	+ 0·72	...	5·6	Velorum	9	29	26	−48	28·4
240·71	−16·95	...	5·5	Carinæ	7	57	34	−60	15·4

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.		α 1880. h	m	s	δ 1880. °	′	″
°	°	m	m								
240·75	+ 4·99	...	5·6	*u* Velorum		9	45	18	−45	10	4
240·87	−17·15	...	cum. 5^m h. 3111	Carinæ	$6^{m}\cdot7$	7	56	50	−60	29	8
241·08	+ 5·80	...	6·1	Velorum		9	49	34	−44	43	0
241·14	− 9·76	...	5·1	*f* Carinæ		8	43	36	−56	19	7
241·14	−11·73	...	5·4	e_2 „		8	32	30	−57	35	7
241·22	+ 4·76	...	6·2	Velorum		9	46	41	−45	38	0
241·28	+ 0·78	...	4·9	M „		9	32	32	−48	49	1
241·31	−11·87	...	5·9	e_1 Carinæ		8	32	28	−57	48	6
241·36	−13·95	...	2·1	ϵ „ , ϵ Argus		8	20	3	−59	7	4
241·48	+ 4·52	...	4·8 *d*	*m* Velorum		9	47	2	−45	59	1
241·53	+14·88	...	5·7	Antliæ		10	18	14	−37	24	1
241·86	− 1·57	...	5·9	Velorum		9	26	0	−50	59	5
241·96	−16·33	...	5·3	B Carinæ		8	7	1	−60	56	3
242·17	− 0·95	...	5·5	L Velorum		9	29	59	−50	43	3
242·30	+21·42	...	5·9	Antliæ		10	37	10	−32	5	3
242·34	+10·51	...	4·0	*q* Velorum		10	9	42	−41	31	7
242·66	− 3·34	...	5·8	I „		9	22	24	−52	51	6
242·89	− 6·13	...	6·0	„		9	10	45	−55	4	4
242·97	−12·28	...	4·7	*d* Carinæ		8	37	58	−59	20	0
243·00	+ 9·75	...	6·2	Velorum		10	10	29	−42	30	8
243·30	+11·66	...	5·3	*r* „		10	17	11	−41	2	8
243·31	− 4·96	...	2·7	κ „ , κ Argus		9	18	24	−54	29	9
243·47	−18·36	...	5·2	D Carinæ		7	58	49	−63	14	1
243·79	−16·58	...	5·7 *d*	C „		8	13	27	−62	32	7
243·93	−10·35	...	5·4 *d*	b_1 „		8	54	2	−58	46	0
243·98	+ 5·29	...	5·7	Velorum		10	1	26	−46	47	0
244·04	−10·02	...	5·7	b_2 Carinæ		8	56	28	−58	37	5
244·11	+ 1·87	...	6·1	Velorum		9	50	23	−49	40	6
244·15	− 2·48	...	6·0	„		9	33	12	−53	7	7
244·38	+14·69	...	5·9	Antliæ		10	29	53	−38	56	5
244·41	+20·94	...	5·8	„		10	44	22	−33	25	4
244·46	− 7·36	...	4·8	*g* Carinæ		9	12	49	−57	2	4
244·52	+ 1·05	...	6·2	Velorum		9	49	26	−50	34	8
244·85	−11·47	...	4·0	*e* Carinæ		8	52	20	−60	11	2
244·97	− 2·07	...	5·8	O Velorum		9	39	38	−53	20	5
244·98	− 8·86	...	3·8	*a* Carinæ		9	7	48	−58	28	6
245·23	−14·49	...	6·0	„		8	35	11	−62	25	9
245·37	−20·59	...	6·2	Volantis		7	48	53	−65	53	4

Galactic Long.	Lat.	Magn. H.P.	U.A.	Star.	α 880. h	m	s	δ °	′	″
245·48	− 9·00	...	6·1	Carinæ	9	9	47	−58	55	2
245·62	− 5·61	var.	3·4 − 4·4	N Velorum	9	27	35	−56	30	3
245·76	− 8·52	...	2·5	ι Carinæ, ι Argus	9	13	53	−58	46	3
245·79	−24·21	...	4·1	δ Volantis	7	16	53	−67	44	2
246·36	−17·76	...	5·7	,,	8	16	59	−65	14	2
246·58	+ 9·58	...	5·4 *d*	*s* Velorum	10	26	49	−44	27	2
246·68	+ 1·30	var.	6·5 − 7·5	R ,,	10	1	38	−51	36	2
246·83	+ 1·85	...	5·3	Q ,,	10	4	23	−51	13	4
246·91	− 1·44	...	3·9	*φ* ,, , *φ* Argus	9	52	39	−53	59	8
247·09	+ 2·71	...	5·8	,,	10	8	45	−50	38	3
247·14	+18·77	...	5·1	*ι* Antliæ	10	51	8	−36	29	6
247·21	− 5·52	...	6·0	Carinæ	9	37	1	−57	26	3
247·25	−17·41	...	3·9	*β* Volantis	8	24	26	−65	44	2
247·39	− 7·00	...	4·9	*h* Carinæ	9	30	58	−58	41	7
247·39	+ 2·28	...	6·2	Velorum	10	8	52	−51	9	7
247·44	−11·18	...	4·3	*i* Carinæ	9	8	33	−61	49	5
247·69	+ 7·98	...	5·6	*t* Velorum	10	27	53	−46	23	1
248·14	−10·61	...	5·5	*k* Carinæ	9	18	4	−61	53	6
248·16	+20·66	...	5·8	Antliæ	10	59	14	−35	9	5
248·53	−20·18	...	4·5	*ε* Volantis	8	7	32	−68	15	9
248·93	+ 7·25	...	4·1	*p* Velorum	10	32	16	−47	36	2
249·23	− 8·21	...	5·1	*m* Carinæ	9	36	2	−60	47	1
249·35	−15·82	...	5·9	Volantis	8	48	57	−66	20	7
249·36	−12·89	...	neb. h. 3152	Carinæ	9	9	41	−64	22	1
249·55	− 9·86	var.	4·3 - 10	R ,,	9	29	14	−62	15	5
249·82	−14·66	...	4·2	*a* Volantis	9	0	33	−65	55	0
249·89	− 0·02	...	5·4	Velorum	10	15	6	−54	25	6
249·96	+14·40	...	4·5	*i* ,, , Centauri	10	54	39	−41	35	0
250·52	− 8·68	var.	3·7 − 5·2	*l* Carinæ	9	41	57	−61	57	3
250·56	−11·85	...	6·6	,,	9	24	8	−64	24	6
250·58	− 0·79	...	5·0	J Velorum	10	16	27	−55	26	4
250·59	+12·94	...	6·2	,, , Centauri	10	54	32	−43	9	8
250·71	+ 0·64	...	6·2	,,	10	22	12	−54	16	0
250·73	+ 1·98	...	5·6 *d*	,,	10	26	42	−53	6	4
250·81	−19·49	...	6·0	Volantis	8	26	59	−69	41	7
250·84	− 5·54	...	6·8)	Carinæ	9	59	8	−59	35	9
250·87	− 5·81	...	6·4)	,,	9	58	11	−59	50	5
250·86	+ 6·90	...	2·9	*μ* Velorum, *μ* Argus	10	41	37	−48	47	2

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
251°·19	− 8°·46	...	6·2	Carinæ	9	47	33	−62	11·0
251·36	−23·87	...	4·3	ζ Volantis	7	43	17	−72	19·1
251·38	+14·53	...	5·5 *d*	Centauri	11	1	44	−41	59·5
251·66	−18·84	...	5·6	θ Volantis	8	38	38	−69	57·5
251·74	−20·77	...	5·2	κ1 „	8	20	9	−71	8·0
...	...	...	5·7 } 4·7	κ2 „	8	20	20	−71	7·4
252·01	+21·67	...	5·4 tr.	Centauri, Hydræ 5m·7	11	17	24	−35	30·4
252·15	− 1·72	...	5·4	Carinæ, P Velorum	10	22	56	−57	1·6
252·26	− 6·24	var.	6·2−9	S „	10	5	33	−60	57·7
252·31	−10·56	...	3·3 *d*	υ „ , υ Argus	9	44	6	−64	30·9
252·56	−15·19	...	6·0	„	9	15	36	−68	11·0
252·62	+ 0·85	...	4·8 *d*	x Velorum	10	34	32	−54	58·7
252·74	− 2·64	...	4·6	ε Carinæ	10	23	29	−58	7·6
252·87	+ 9·68	...	6·0	Velorum	10	59	7	−47	2·0
252·92	− 5·56	...	3·3	q Carinæ	10	13	5	−60	44·0
252·97	+ 9·98	...	6·9	Centauri	11	0	20	−46	47·7
253·07	− 1·12	...	5·3	r Carinæ	10	30	59	−56	56·2
253·07	−16·17	...	2·0	β „ , β Argus	9	11	52	−69	13·4
253·24	−17·20	...	5·2	E „	9	4	39	−70	3·3
253·38	− 1·67	...	5·7 cum.	„	10	31	8	−57	34·3
253·56	−21·60	...	5·7	η Volantis	8	23	8	−73	0·7
254·08	+ 0·29	...	5·8	Velorum	10	42	7	−56	7·5
254·10	− 2·84	...	5·5	t_1 Carinæ	10	31	51	−58	56·5
254·19	− 2·37	...	5·2 *d*	t_2 „	10	34	11	−58	33·5
254·60	− 9·82	...	5·7	„	10	5	22	−65	13·7
254·64	− 4·96	...	3·6	p „	10	27	46	−61	4·1
254·65	− 2·16	...	6·5	„	10	38	3	−58	35·2
254·65	+ 8·84	...	5·8	Centauri	11	7	5	−48	27·0
254·71	− 2·66	...	7·0 var.	Carinæ	10	36	43	−59	3·0
254·85	−18·59	...	4·8	G „	9	4	49	−72	7·2
254·97	+ 0·18	...	6·0	„	10	47	36	−56	36·2
255·13	− 2·45	var.	>1−7·2	η „ , η Argus	10	40	25	−59	3·2
255·21	+15·82	...	5·4 *d*	Centauri	11	22	48	−42	0·8
255·29	−16·68	...	6·0	Carinæ	9	25	55	−71	4·8
255·32	−10·02	...	5·7	M „	10	10	7	−65	46·7
255·32	+18·19	...	6·2	Centauri	11	26	58	−39	46·5
255·36	− 3·33	...	5·2	w Carinæ	10	38	58	−59	56·3
255·52	+18·09	...	5·7	Centauri	11	27	47	−39	55·5

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′	″
255·55	− 7·30	...	6·1	Carinæ	10	24	53	−63	33	5
...	...	...	7·0 } 6·1	,,	10	43	3	−59	14	5
255·58	− 2·49	...	6·7 }	,,	10	43	24	−59	17	1
255·75	− 1·24	...	4·1	u ,,	10	48	37	−58	13	0
256·41	− 9·97	...	5·4	L ,,	10	19	25	−66	17	7
256·57	− 2·70	var.	6·2−6·8	,,	10	50	30	−59	52	8
256·61	− 1·82	var.	6·8−?	,,	10	52	55	−59	5	4
256·63	−17·51	...	5·9	H ,,	9	30	42	−72	32	9
256·74	−23·57	...	4·2	α Chamæleontis	8	21	36	−76	32	4
256·93	− 6·34	...	5·6	Carinæ	10	39	47	−63	19	9
256·97	− 6·88	...	5·7	,,	10	37	59	−63	50	3
257·01	− 6·78	...	2·9	θ ,, , θ Argus	10	38	41	−63	46	0
257·24	− 0·42	...	6·5 cum.	,,	11	1	24	−58	1	6
257·26	−19·49	...	5·7	,,	9	17	37	−74	23	3
257·30	− 6·49	...	6·2	,,	10	42	7	−63	37	9
257·34	−23·73	...	4·7	θ Chamæleontis	8	24	13	−77	5	8
257·38	− 6·59	...	5·8 cum.	Carinæ	10	42	29	−63	45	1
257·39	−13·07	...	3·6	ω ,, , ω Argus	10	10	53	−69	26	5
257·60	− 0·60	...	4·6	x ,,	11	3	28	−58	19	5
257·67	+ 16·06	...	6·1	Centauri	11	35	26	−42	25	8
257·69	+ 4·18	...	4·3	π ,,	11	15	32	−53	50	0
257·75	+ 11·65	...	6·0	C_1 ,,	11	29	26	−46	42	5
257·94	+ 11·43	...	5·5	C_2 ,,	11	30	7	−46	58	4
258·04	+ 18·81	...	5·4	,,	11	40	48	−39	50	8
258·19	+ 9·94	...	6·0	,,	11	29	12	−48	28	7
258·24	+ 11·40	...	5·9	C_3 ,,	11	31	45	−47	5	0
258·55	− 1·68	...	5·2	y Carinæ	11	7	27	−59	39	9
258·62	− 3·90	...	5·3	z ,,	11	1	38	−61	46	6
258·67	− 3·36	...	6·0	,,	11	3	35	−61	17	9
259·11	+ 13·74	...	5·9	Centauri	11	39	48	−45	1	4
259·32	−23·60	...	5·6	η Chamæleontis	8	45	22	−78	31	6
259·55	+ 4·99	...	5·2	A Centauri	11	29	5	−53	36	1
259·62	−14·02	...	5·0	K Carinæ	10	27	18	−71	22	5
259·90	− 5·29	...	5·7	,,	11	7	48	−63	31	0
259·95	+ 14·45	...	5·0	B Centauri	11	45	9	−44	30	3
259·99	−19·62	...	6·1	ν Chamæleontis	9	45	16	−76	13	0
260·31	− 15·06	...	5·6	Carinæ	10	28	14	−72	36	3
260·32	− 15·99	...	4·4	I ,,	10	22	1	−73	25	3

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
260·43	− 1·89	...	6·2	Centauri	11	21	12	−60	27·3
260·56	− 0·10	...	5·2	o_1 ,,	11	26	14	−58	46·8
260·59	− 0·17	...	5·5	o_2 ,,	11	26	16	−58	51·2
261·19	− 4·64	...	5·7	,,	11	20	32	−63	18·6
261·24	− 5·66	...	5·7 *d*	Muscæ, Carinæ	11	18	11	−64	17·8
261·55	− 1·50	...	6·6 cum.	Centauri	11	30	47	−60	23·3
261·61	− 2·03	...	6·5 cum.	,, 7^m	11	30	11	−60	54·9
261·69	− 1·70	...	5·9	,,	11	31	28	−60	37·2
261·70	+ 17·57	...	5·7	,,	11	57	27	−41	45·7
261·80	− 11·75	...	6·1	Carinæ	11	2	30	−70	13·8
261·95	− 2·19	...	6·0	Centauri	11	32	31	−61	9·8
261·99	− 3·41	...	3·4	λ ,,	11	30	15	−62	21·4
262·14	− 23·25	...	5·8	ι Chamæleontis	9	28	6	−80	16·1
262·33	− 2·37	...	5·7	Centauri	11	35	14	−61	25·5
262·50	+ 19·36	...	5·9	,,	12	2	42	−40	33·8
262·55	− 23·08	...	5·5	ζ Chamæleontis	9	37	22	−80	24·1
262·59	+ 2·92	...	6·1	Centauri	11	46	15	−56	19·3
262·72	− 2·68	...	5·8	,,	11	37	48	−61	49·4
262·77	− 1·32	...	4·7	,,	11	40	43	−60	30·7
263·00	− 5·61	...	5·8	Muscæ, Centauri	11	33	56	−64	44·0
263·00	+ 15·85	...	6·2	Centauri	12	2	42	−43	39·4
263·28	+ 3·74	...	6·1	Crucis, Centauri	11	52	12	−55	39·0
263·37	− 19·59	...	4·4	γ Chamæleontis	10	34	2	−77	59·1
263·55	+ 11·51	...	6·1	E Centauri	12	2	2	−48	1·5
263·60	− 12·58	...	6·1	Muscæ, Chamæleontis	11	19	25	−71	35·9
263·69	− 3·79	...	4·9	*j* Centauri	11	43	51	−63	7·3
263·80	+ 9·56	...	5·8	,,	12	1	53	−49	59·6
263·85	+ 9·51	...	2·8	δ ,,	12	2	9	−50	3·2
263·93	− 6·76	...	3·8	λ Muscæ	11	39	57	−66	3·8
264·13	+ 14·59	...	5·8 *d*	D Centauri	12	7	47	−45	3·4
264·19	− 6·78	...	5·3	μ Muscæ	11	42	29	−66	8·8
264·22	− 5·13	...	5·5 *d*	,, , Centauri	11	46	0	−64	32·3
264·27	− 23·38	...	6·0	μ Chamæleontis	10	3	52	−81	38·0
264·60	+ 7·95	...	4·5	ρ Centauri	12	5	23	−51	42·0
...	...	...	6·2	δ_1 Chamæleontis	10	44	6	−79	50·2
264·80	− 21·06	...	4·9 } 4·5	δ_2 ,,	10	44	38	−79	54·5
265·07	− 3·05	...	4·7	θ_1 Crucis	11	56	55	−62	38·7
265·10	− 10·08	...	5·6	Muscæ	11	44	13	−69	33·5

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
265·18	− 2·88	...	5·3	θ_2 Crucis	11	58	9	−62	29·9
265·58	−15·80	...	6·2	π Chamæleontis	11	32	20	−75	14·0
265·68	− 4·27	...	4·7	η Crucis	12	0	38	−63	56·7
265·88	+ 1·68	...	3·4	δ „	12	8	47	−58	4·9
266·01	+ 5·32	...	5·8	F Centauri	12	12	36	−54	28·6
266·03	− 7·97	...	6·0	Muscæ	11	58	28	−67	39·6
266·81	+ 9·10	...	5·7	G Centauri	12	20	3	−50	47·1
266·84	+ 0·12	...	4·0	ϵ Crucis	12	14	54	−59	44·3
266·85	− 3·51	...	4·6	ζ „	12	11	57	−63	20·2
266·96	+10·33	...	4·3	σ Centauri	12	21	33	−49	33·9
267·02	− 9·67	var.	6·5 −?	Muscæ	12	6	20	−69	29·0
267·19	− 7·45	...	4·7 var.?	ϵ „	12	11	6	−67	17·6
267·22	− 1·08	...	... var.?	Crucis	12	17	3	−60	57·8
267·38	−16·06	...	5·6	κ Chamæleontis	11	58	36	−75	51·2
267·39	−14·89	...	5·8	Muscæ, Chamæleontis	12	1	32	−74	42·0
267·40	−17·78	...	5·0	ϵ Chamæleontis	11	53	41	−77	33·2
267·47	+ 4·18	...	6·2	Crucis, Centauri	12	22	2	−55	44·2
267·58	− 6·97	...	5·8	ζ Muscæ	12	15	28	−66	51·4
267·65	+ 4·06	...	5·9	Crucis, Centauri	12	23	18	−55	51·7
267·68	− 2·42	...	1·3 *d*	α „	12	19	56	−62	26·0
267·80	+15·95	...	6·2	Centauri	12	28	13	−44	0·2
267·84	+19·60	...	5·7	„	12	29	18	−40	21·6
267·86	+ 3·50	...	2·0	γ Crucis	12	24	31	−56	26·5
268·48	+12·10	...	4·4	τ Centauri	12	31	9	−47	52·8
268·51	−18·73	...	4·6	β Chamæleontis	12	11	20	−78	38·8
268·63	+20·66	...	5·2	l Centauri	12	33	23	−39	19·6
268·81	−11·50	...	4·0	γ Muscæ	12	25	19	−71	28·2
268·83	−12·37	...	6·2	„	12	24	56	−72	20·2
269·08	− 8·48	...	2·9	α „	12	30	3	−68	28·4
269·13	+11·69	...	2·4	γ Centauri	12	34	54	−48	18·0
269·31	+11·84	...	5·4	w „	12	35	57	−48	9·2
269·36	+ 0·97	...	6·0	Crucis	12	35	3	−59	1·6
269·46	− 2·32	...	cum. h. 3407	„	12	35	23	−62	18·7
269·51	− 2·40	...	6·1	„	12	35	49	−62	24·0
269·52	− 8·75	var.	6·6 −7·4	R Muscæ	12	34	46	−68	44·9
269·70	− 7·45	...	3·4	β „	12	38	56	−67	27·1
269·82	− 0·32	...	5·7	ι Crucis	12	38	35	−60	19·3
269·93	+ 4·17	...	5·4	„ , Centauri	12	39	30	−55	49·9

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
270·10	+ 0·97	...	1·7	β Crucis	12	40	43	−59	1·9
270·64	+ 7·86	...	6·2	Centauri	12	44	6	−52	8·0
270·70	+ 2·22	var.	6·8−7·6	Crucis	12	47	17	−57	46·7
270·79	+ 0·32	...	6·3	,,	12	46	13	−59	40·5
270·84	+ 0·27	...	6·7 cum. 5·6	κ ,,	12	46	40	−59	43·4
270·99	+ 1·49	...	5·6	λ ,,	12	47	32	−58	29·7
271·00	−10·21	...	cum. h. 3444	Muscæ	8m	12	51	38 −70	11·1
271·04	+ 3·46	...	4·4	μ Crucis	12	47	33	−56	31·6
...	...	...	5·5 4·1	,,	12	47	34	−56	31·0
271·08	+11·70	...	5·0	e Centauri	12	46	20	−48	17·4
271·17	−10·93	...	3·7	δ Muscæ	12	54	2	−70	54·1
271·24	+ 3·79	...	6·0	Crucis, Centauri	12	48	54	−56	11·1
271·44	+20·46	...	4·4	n Centauri	12	46	48	−39	31·5
271·64	+ 9·42	...	5·8	H ,,	12	50	10	−50	32·9
271·68	+17·71	...	6·1	,,	12	48	38	−42	15·8
272·19	− 4·75	...	5·9	θ Muscæ	13	0	23	−64	39·8
272·49	−14·43	...	5·6	ι_1 ,,	13	15	42	−74	15·4
272·64	− 7·39	...	5·3	η ,,	13	7	8	−67	15·5
272·78	+11·03	...	5·8	ξ_1 Centauri	12	56	37	−48	52·9
272·80	−23·59	...	4·7	δ Octantis	14	7	52	−83	6·9
272·96	− 6·31	...	5·5	Muscæ	13	9	9	−66	8·9
273·12	+ 7·06	...	6·1	Centauri	13	0	31	−52	49·0
273·16	+ 0·57	...	5·4	,,	13	4	49	−59	16·9
273·21	−10·23	...	6·1	Muscæ	13	17	7	−70	0·0
273·30	+10·61	...	4·8	ξ_2 Centauri	12	59	55	−49	15·8
273·31	+12·05	...	5·3	f ,,	12	59	20	−47	49·2
273·50	+ 1·36	...	5·9	,,	13	6	50	−58	27·7
273·62	−21·02	...	5·3	η Apodis	14	3	16	−80	26·6
273·65	+ 7·57	var.	6·7−7·2	Centauri	13	3	40	−52	16·1
273·95	− 4·18	...	5·2	m ,, , Muscæ	13	15	58	−63	54·4
273·95	+18·91	...	6·3	,,	12	59	48	−40	56·7
273·98	−23·67	...	6·0	π_1 Octantis	14	40	54	−82	44·4
274·15	−20·25	...	5·5	ϵ Apodis	14	7	58	−79	33·2
274·18	−23·55	...	5·9	π_2 Octantis	14	44	4	−82	33·2
274·30	− 0·64	...	5·2	J Centauri	13	14	53	−60	21·5
274·51	−16·85	...	5 var.	θ Apodis	13	53	41	−76	13·0
274·71	+17·05	...	5·7	Centauri	13	4	32	−42	43·7
274·78	+18·19	...	6·1	,,	13	4	19	−41	35·6

Galactic Long.	Lat.	Magn. H.P.	U.A.	Star.		α 1880. h	m	s	δ 1880. °	′	″
°	°	m	m								
275·15	+ 7·56	...	6·1		Centauri	13	13	21	−52	7	0
275·73	+16·33	...	6·1		,,	13	10	17	−43	20	7
275·74	−19·77	...	4·0	α	Apodis	14	33	2	−78	32	0
276·72	− 3·05	...	cum. h. 3531		Centauri	7m·0 13	38	14	−62	18	4
276·74	+ 8·92	...	5·8	K	,,	13	22	4	−50	32	6
276·95	+12·63	...	cum. 4m	ω	,,	13	19	46	−46	51	6
277·08	+ 1·10	...	6·1		,,	13	34	4	−58	10	7
277·21	−10·26	...	6·4		Circini, Apodis	14	1	10	−69	8	9
277·45	−17·95	...	5·5		Apodis	14	44	16	−76	10	3
277·45	+23·44	...	3·0	ι	Centauri	13	13	51	−36	4	7
277·73	− 4·11	...	5·7		,,	13	48	59	−63	5	8
277·90	+ 6·36	...	2·6	ϵ	,,	13	32	18	−52	51	3
277·94	+ 5·24	...	5·7 *d*	Q	,,	13	34	4	−53	57	0
277·95	+18·53	...	6·2		,,	13	19	57	−40	52	4
278·09	+20·27	...	5·9		,,	13	19	10	−39	7	7
278·75	− 7·48	...	6·2		Circini	14	7	11	−66	1	6
278·93	−14·77	...	6·1		Apodis	14	41	16	−72	41	6
278·94	− 9·27	...	6·0		Circini, Apodis	14	15	11	−67	38	9
279·15	+20·45	...	4·5	*d*	Centauri	13	24	5	−38	47	2
279·35	− 1·13	...	1·2	β	,,	13	55	22	−59	47	6
279·36	+ 8·13	...	5·2	M	,,	13	39	4	−50	49	8
279·68	−22·28	...	5·2 } 4·6	δ_1	Apodis	16	2	28	−78	23	4
...	...	...	5·5 }	δ_2	,,	16	2	35	−78	21	7
279·78	+ 9·17	...	6·0		Centauri	13	40	8	−49	43	2
279·84	+ 6·58	...	5·9	N	,,	13	44	21	−52	12	9
279·95	−22·91	...	3·9	γ	Apodis	16	15	6	−78	37	5
280·47	+ 7·09	...	6·1		Centauri	13	47	28	−51	34	2
280·77	+19·48	...	6·2		,,	13	32	46	−39	26	4
280·92	− 2·61	...	5·9		,,	14	11	4	−60	42	9
281·00	− 1·19	var.	6·0−10	R	,,	14	7	56	−59	21	2
281·23	−16·42	...	5·8	κ_1	Apodis	15	18	28	−72	58	2
281·30	+12·32	...	6·2		Centauri	13	44	22	−46	18	2
281·48	−22·47	...	4·5	β	Apodis	16	25	59	−77	15	7
281·71	− 8·74	...	6·1		Circini	14	38	36	−66	5	3
281·71	−16·85	...	6	κ_2	Apodis	15	27	5	−73	2	9
281·75	+ 1·54	...	5·6		Centauri	14	6	36	−56	31	4
281·83	+11·77	...	2·7	ζ	,,	13	48	4	−46	41	8
281·85	− 7·01	...	3·5	α	Circini	14	32	50	−64	27	0

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ °	′
°	°	m	m						
282·03	−12·94	...	6·2	Triang. aust.	15	2	50	−69	37·5
282·07	+16·70	...	3·4	μ Centauri	13	42	24	−41	52·5
282·24	− 0·10	...	5·6 *d*	„	14	14	2	−57	54·6
282·25	+17·46	...	3·7	ν „	13	42	19	−41	5·3
282·25	+ 5·23	...	5·4	„	14	1	56	−52	52·0
282·41	−11·57	var.	7·0	T Triang. aust.	14	58	36	−68	15·4
282·64	+ 4·85	...	6·1	Centauri	14	5	12	−53	6·0
282·67	+ 1·95	...	5·0	ν „	14	11	57	−55	50·0
283·03	− 5·24	...	6·0	Circini, Centauri	14	35	48	−62	21·7
283·06	+14·02	...	4·2	υ_1 Centauri	13	51	16	−44	13·0
283·17	−11·99	...	3·1	γ Triang. aust.	15	7	44	−68	14·1
283·36	+13·10	...	5·0	υ_2 Centauri	13	54	15	−45	1·3
283·40	− 3·18	...	0·7 *d*	α „	14	31	27	−60	20·4
283·44	+10·22	...	cum. h. 3555	„	8m·7 13	59	34	−47	44·9
283·78	+16·64	...	4·1	φ „	13	50	59	−41	30·8
283·90	−17·32	...	6·1	Apodis	15	52	35	−72	4·0
284·24	− 5·76	...	5·8	θ Circini	14	47	5	−62	17·5
284·42	− 7·29	...	5·9	η „	14	54	47	−63	33·5
284·46	−10·21	var.	6·6−8·0	R Triang. aust.	15	9	3	−66	3·2
285·39	− 3·34	...	5·9	Circini	14	46	20	−59	37·2
285·52	+17·07	...	4·8	χ Centauri	13	58	43	−40	36·2
285·87	− 7·67	...	5·5	ε Circini	15	7	32	−63	9·9
285·93	−13·95	...	5·7	κ Triang. aust.	15	43	40	−68	14·6
285·97	−11·04	...	4·6	ε „ „	15	25	45	−65	54·7
286·18	+ 1·31	...	6·5	Circini, Centauri	14	36	33	−55	5·5
286·19	+11·68	...	3·8	ι Lupi	14	11	44	−45	30·2
286·58	−18·01	...	5·9	Apodis, Triang. aust.	16	21	6	−70	43·5
286·60	+ 6·77	...	5·2	σ Lupi	14	24	32	−49	55·4
286·63	+ 7·78	...	5·9	„	14	22	22	−48	58·9
286·73	+12·41	...	5·7	„ , Centauri	14	13	3	−44	37·9
286·96	−17·05	...	5·6	ζ Triang aust.	16	15	34	−69	48·7
...	...	...	6·3 } 5·4	Circini	15	6	56	−60	27·4
287·23	− 5·40	...	5·6 }	δ „	15	7	16	−60	30·6
287·28	+21·61	...	2·2	5 θ Centauri	13	59	37	−35	46·7
287·44	−11·06	...	6·1	Triang. aust.	15	36	58	−65	3·8
287·57	+11·87	...	4·9	τ_2 Lupi	14	18	28	−44	50·1
287·62	+12·02	...	5·3	τ_1 „	14	18	26	−44	40·6
287·68	− 5·12	...	5·9	Circini	15	9	10	−60	3·2

Galactic Long.	Lat.	Magn. H.P.	U.A.	Star.	α 1880. h	m	s	δ 1880. °	′	″
287·80	+ 7·37	...	4·5	ρ Lupi	14	29	49	−48	54	1
287·83	+ 4·09	...	5·8	*b* „	14	38	38	−51	52	5
288·04	− 5·55	...	6·1	Circini	15	13	28	−60	13	4
288·25	+ 11·66	...	6·2	Lupi	14	22	25	−44	47	0
288·46	− 3·61	...	4·7	β Circini	15	8	8	−58	21	1
288·61	− 11·50	...	6·1	Triang. aust.	15	47	59	−64	41	2
288·81	− 4·45	...	5·2	γ Circini	15	13	50	−58	53	2
288·88	+ 10·38	...	6·2	Lupi	14	28	28	−45	43	2
288·89	+ 3·07	...	6·0	*c* „	14	47	45	−52	19	3
288·99	− 17·75	...	2·2	α Triang. aust.	16	35	58	−68	48	3
289·09	+ 10·41	...	6 0 *d*	Lupi	14	29	29	−45	36	5
289·27	+ 8·94	...	2 6	α „	14	33	57	−46	52	3
289·30	+ 17·53	...	4·9	*a* Centauri	14	15	39	−38	57	7
289·38	− 10·01	...	3·1	β Triang. aust.	15	44	35	−63	3	5
289·38	− 18·68	...	6·2	„ „	16	46	42	−69	4	5
289·47	+ 19·22	...	4·4	ψ Centauri	14	13	16	−37	19	9
289·55	− 0·22	...	6·3	Lupi	15	2	20	−54	53	2
289·71	− 20·79	...	5·8	ι Apodis	17	8	44	−69	59	6
290·46	− 16·44	...	5 6	Triang. aust.	16	34	36	−66	52	9
290·47	+ 14·17	...	2·5	η Centauri	14	27	53	−41	37	8
290·88	− 11·74	...	4·3	δ Triang. aust.	16	4	32	−63	22	6
291·04	− 14·56	...	6·0	θ „ „	16	24	12	−65	14	3
291·27	+ 7·39	...	6·1 *d*	Lupi	14	48	23	−47	23	5
291·37	+ 2·47	...	3·6	ζ „	15	3	40	−51	38	5
291·39	− 7·85	...	6·2	Triang. aust.	15	46	0	−60	7	4
291·53	+ 15·84	...	6·2	Centauri	14	29	12	−39	41	1
291·54	− 7·58	...	6·2	Normæ, Triang. aust.	15	45	30	−59	49	0
291·58	− 12·99	...	5·8	ι Triang. aust.	16	16	49	−63	47	0
291·88	− 19·61	...	5·4	ζ Apodis	17	9	27	−67	38	5
292·09	− 8·48	...	cum. h. 3616	Triang. aust. $6^{m}\cdot8$	15	53	33	−60	9	6
292·55	+ 11·59	...	5·0	*o* Lupi	14	43	49	−43	4	6
292·95	+ 7·41	...	4·3	π „	14	56	57	−46	34	8
293·07	+ 5·37	...	4·1 *d*	κ „	15	3	36	−48	16	8
293·57	+ 17·58	...	4·2	*b* Centauri	14	34	31	−37	16	6
293·64	− 11·60	...	5·8	Triang. aust., Aræ	16	20	10	−61	21	9
293·89	+ 11·39	...	2·8	β Lupi	14	50	41	−42	38	9
293·91	− 6·46	...	5·4	ι_1 Normæ	15	53	47	−57	26	1
294·17	+ 19·15	...	6·2	Centauri	14	33	39	−35	37	0

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
294·37	− 3·26	...	6·1	Normæ	15	41	48	−54	41·3
294·37	− 7·07	...	6·0	i_2 „	15	59	27	−57	36·6
294·42	+ 8·60	...	4·8	λ Lupi	15	0	46	−44	49·0
294·47	+ 5·52	...	4·8 *d*	μ „	15	10	11	−47	25·9
294·51	+ 12·23	...	3·3	κ Centauri	14	51	22	−41	37·3
294·57	− 0·02	...	5·8	Normæ	15	29	55	−51	58·5
294·96	+ 5·15	...	5·8	ν_1 Lupi	15	13	47	−47	29·4
295·02	− 7·66	...	6·0	Normæ	16	5	55	−57	36·3
295·14	+ 19·77	...	4·3	c_1 Centauri	14	36	19	−34	39·3
295·32	− 7·93	...	cum. h. 3622	R Normæ	16	8	56	−57	36·1
295·37	+ 18·01	...	6·8	Centauri	14	41	12	−36	7·8
295·42	+ 19·61	...	5·4	c_2 „	14	37	38	−34	40·9
295·42	− 1·74	...	6·0	Normæ	15	41	1	−52	50·3
295·44	+ 8·90	...	5·5	*e* Lupi	15	4	46	−44	2·7
295·56	+ 16·58	...	5·7	Centauri, Lupi	14	45	20	−37	18·5
295·68	− 9·30	...	6·1	Normæ, Aræ	16	18	8	−58	19·5
295·78	− 3·82	...	6·7	„	15	51	46	−54	14·0
295·93	− 20·28	...	3·8	η Pavonis	17	33	58	−64	39·8
296·06	+ 12·55	...	5·7	Lupi	14	57	32	−40	35·9
296·44	− 17·28	...	6·2	Aræ	17	12	45	−62	44·6
296·54	+ 5·44	...	5·9	Lupi	15	21	3	−46	18·9
296·79	+ 12·69	...	6·2	„	15	0	26	−40	7·1
296·82	+ 7·78	...	3·7	ϵ „	15	14	32	−44	15·4
297·07	− 5·06	...	5·5	κ Normæ	16	4	1	−54	19·1
297·20	− 11·69	...	3·8	η Aræ	16	39	26	−58	49·5
297·34	− 4·74	...	cum. 6·0 h. 3619	Normæ	16	3	53	−53	54
297·34	− 11·01	...	6·1	Aræ	16	36	7	−58	16·7
297·55	− 11·01	...	6·0	„	16	37	7	−58	7·1
297·58	+ 11·13	...	5·8	Lupi	15	8	11	−41	2·7
297·93	− 9·36	...	var. 7−8	Aræ	16	29	47	−56	45·1
297·98	− 4·80	...	6·0	Normæ	16	7	20	−53	30·5
298·06	− 22·12	...	4·6	π Pavonis	17	57	2	−63	40·2
298·13	+ 19·74	...	5·8	Centauri	14	48	23	−33	22·0
298·44	+ 11·42	...	6·2	Lupi	15	11	5	−40	20·8
298·59	+ 6·22	...	5·1 *d*	*d* „	15	27	38	−44	33·3
298·86	− 16·89	...	3·7	δ Aræ	17	20	16	−60	34·9
298·91	+ 11·28	...	3·7	δ Lupi	15	13	30	−40	12·7
298·98	− 22·64	...	6·0	Pavonis	18	4	17	−63	5·0

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
		m	m						
298°99	+ 6°65	...	6·2	Lupi	15	27	59	−43	59·6
299·48	− 12·40	...	6·2	Aræ	16	54	12	−57	32·2
299·55	+ 5·90	...	5·2	*g* Lupi	15	32	57	−44	15·7
299·55	− 0·01	...	5·2	*η* Normæ	15	54	24	−48	53·6
299·80	− 21·70	...	5·8	*ι* Pavonis	17	59	17	−62	1·5
299·99	+ 11·69	...	5·9	*υ* Lupi	15	16	55	−39	16·9
300·17	+ 20·01	...	5·8	„	14	55	39	−32	10·1
300·36	+ 7·90	...	4·7	*ω* „	15	29	58	−42	10·3
300·40	+ 10·74	...	3·2	*ζ* Aræ	16	48	42	−55	47·9
300·59	− 18·87	...	6·2	Pavonis, Telescopii	17	40	48	−60	7·4
300·62	− 2·15	...	5·4	γ_1 Normæ	16	8	2	−49	46·0
300·66	+ 12·43	...	5·1	k Lupi	15	17	34	−38	18·4
300·76	+ 9·35	...	3·2	*γ* „	15	27	9	−40	45·7
300·90	− 2·52	...	4·6	γ_2 Normæ	16	10	52	−49	51·5
300·90	− 22·93	...	4·4	*ξ* Pavonis	18	12	10	−61	32·7
301·40	+ 14·22	...	5·1	ϕ_2 Lupi	15	15	29	−36	25·6
301·52	+ 14·86	...	3·6	ϕ_1 „	15	14	12	−35	49·5
301·60	− 2·40	...	5·9	Normæ	16	13	30	−49	17·0
302·15	+ 13·81	...	6·0	Lupi	15	19	37	−36	20·7
302·26	− 14·01	...	3·6	*γ* Aræ	17	15	18	−56	15·7
302·28	0·00	...	5·4	*θ* Normæ	16	6	33	−47	3·9
302·56	+ 10·58	...	6·1	Lupi	15	30	49	−38	43·9
302·66	+ 2·64	...	4·9	*δ* Normæ	15	58	1	−44	50·8
302·75	− 9·12	..	4·2	ϵ_1 Aræ	16	50	1	−52	58·4
302·99	− 13·54	...	2·8	*β* „	17	15	20	−55	24·8
303·02	+ 19·62	...	5·5	1 *i* Lupi	15	7	16	−31	4·2
303·03	− 9·58	...	5·9	ϵ_2 Aræ	16	53	34	−53	3·3
303·59	− 1·55	...	4·8 *d*	*ε* Normæ	16	18	23	−47	16·7
303·67	− 4·73	...	6·0	Aræ	16	32	35	−49	24·9
303·99	+ 6·05	...	5·5	Lupi	15	21	20	−41	23·9
304·17	− 0·94	...	5·9	Normæ	16	21	1	−45	58·5
304·25	+ 11·45	...	5·8	*h* Lupi	15	34	50	−37	2·3
304·33	− 4·09	...	5·6 *d*	Aræ	16	32	21	−48	31·5
304·39	− 7·16	...	6·9	„	16	46	54	−50	28·7
304·45	+ 20·36	4·7	4·7	2 *f* Lupi	15	10	32	−29	42·4
304·63	− 7·40	...	6·0	Aræ	16	49	2	−50	27·0
304·89	− 14·56	...	5·8	*π* „	17	28	14	−54	25·1
305·25	− 22·37	...	6·0	Pavonis	18	19	26	−57	35·7

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880.	δ 1880.
°	°	m	m		h m s	° ′
305·69	+14·18	4·6	5·1	3 ψ_1 Lupi	15 32 9	−34 1·1
305·82	−14·47	...	cum. neb. h. 3692	Aræ	6ᵐ·7 17 30 55	−53 36·6
305·99	+13·57	...	5·1	4 ψ_2 Lupi	15 35 2	−34 19·4
306·06	+ 2·89	...	5·7	λ Normæ	16 10 57	−42 22·7
306·07	−20·21	...	5·7	Telescopii	18 7 1	−56 3·5
306·31	+ 8·49	...	3·7	η Lupi	15 52 10	−38 3·1
306·61	−15·71	...	6·1 *d*	Aræ	17 40 42	−53 34·2
306·65	+ 7·91	...	5·6	Lupi	15 55 26	−38 16·0
306·67	+13·07	...	5·8	,,	15 39 5	−34 18·3
306·96	0·00	...	5·5	μ Normæ	16 25 34	−43 47·3
307·24	−10·95	...	5·8	κ Aræ	17 16 39	−50 31·3
307·73	−14·00	...	5·7	μ ,,	17 34 37	−51 46·1
308·05	+13·32	4·0	4·2	5 χ Lupi	15 43 20	−33 15·6
308·11	+ 0·50	...	6·0	Normæ	16 27 56	−42 36·5
308·26	+ 3·56	...	cum. h. 3626	Scorpii	8ᵐ 16 16 51	−40 21·8
308·28	+ 1·85	...	5·9	,, , Normæ	16 23 22	−41 33·3
308·35	+ 8·82	...	4·9	θ Lupi	15 58 43	−36 28·4
308·41	−11·33	...	2·9	α Aræ	17 22 34	−49 46·7
308·51	+17·95	3·9	3·8	40 τ Libræ, Scorpii	15 31 17	−29 22·9
308·79	+12·26	4·5	5·2 *d*	ξ Lupi	15 49 13	−33 36·8
308·92	+19·85	5·3	5·7	36 Libræ, Scorpii	15 27 21	−27 38·5
309·16	+ 4·72	...	5·8	Scorpii	16 15 54	−38 54·6
309·31	+19·46	3·9	3·9	39 *v* Libræ, Scorpii	15 29 44	−27 44·2
309·56	−12·25	...	5·6	Aræ	17 31 8	−49 20·3
309·66	− 8·82	...	5·8	,,	17 14 16	−47 20·9
309·91	− 7·73	...	6·1	,,	17 9 56	−46 30·6
310·40	+ 5·79	...	5·7	Scorpii	16 16 32	−37 17·0
310·61	− 1·61	...	5·8	ζ_1 ,,	16 45 32	−42 9·6
310·65	+ 0·70	...	5·9	,,	16 36 24	−40 36·7
310·70	− 1·69	...	3·6	ζ_2 ,,	16 46 8	−42 9·2
310·77	− 5·35	...	5·7	,,	17 2 1	−44 24·0
311·05	− 1·26	...	cum. 5ᵐ5h. 3652	,,	6ᵐ·6 16 45 37	−41 36·3
311·05	−16·30	...	3·9	θ Aræ	17 57 17	−50 5·8
311·10	+10·74	...	6·0	Scorpii	16 2 11	−33 13·5
311·19	− 0·54	...	5·9	,,	16 43 12	−41 1·3
311·37	− 8·42	...	5·7 *d*	Aræ	17 18 1	−45 44·0
311·39	−24·83	...	5·2	λ Telescopii	18 48 52	−53 5·6
311·65	−10·05	...	5·	σ Aræ	17 26 44	−46 25·2

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.		Star.		α 1880. h	m	s	δ °	′	″
311·81	−11·09	...	6·3		Aræ		17	32	17	−46	51	2
311·98	−23·74	...	5·7		κ Telescopii		18	43	8	−52	14	6
311·98	− 4·77	...	3·6		η Scorpii		17	3	34	−43	4	7
312·02	+ 1·35	...	6·0		,,		16	38	36	−39	9	3
312·03	+15·80	4·0	4·5	5	ρ ,,		15	49	29	−28	51	7
312·11	− 1·01	...	6·5 cum.		,,		16	48	15	−40	37	7
312·51	− 7·08	...	5·8		,,		17	15	31	−44	2	7
312·64	+ 3·92	...	6·2		,,		16	31	4	−36	58	4
312·60	−10·13	...	7·0		Aræ		17	30	2	−45	40	8
312·90	−10·04	? var. M. N. 38, 330			,, ? Nova 1862		17	30	30	−45	23	
312·85	+22·31	5·2	5·7	42	Libræ		15	33	11	−23	25	6
313·02	− 0·03	...	cum. h. 3654		Scorpii	$7^m·0$	16	47	23	−39	18	5
313·44	+ 6·76	...	4·6		N ,,		16	23	33	−34	26	5
313·45	+19·25	4·8	5·3	1	b ,,		15	43	46	−25	23	1
313·61	−19·13	...	4·5		ζ Telescopii		18	19	35	−49	8	0
313·67	+ 1·47	...	3·6		μ_1 Scorpii		16	43	45	−37	50	4
313·72	+ 5·64	...	4·4		H ,,		16	28	29	−35	0	4
313·75	+ 1·41	...	3·9		μ_2 ,,		16	44	13	−37	48	6
313·88	+18·19	5·5	6·3	4	,,		15	48	15	−25	54	6
314·21	+19·17	4·7	5·2	2	A ,,		15	46	25	−24	58	0
314·22	+13·54	5·1	5·8		,,		16	3	35	−29	5	9
314·40	−18·47	...	6·2		Telescopii		18	17	47	−48	10	8
314·47	+11·19	5·4	5·8 d		Scorpii		16	11	57	−30	36	9
314·57	+17·79	3·1	3·4	6	π ,,		15	51	36	−25	46	0
314·80	− 8·41	...	2·1		θ ,,		17	28	42	−42	55	1
314·84	+19·71	5·6	5·8		,,		15	46	44	−24	10	4
315·00	− 2·56	...	5·9		,,		17	3	59	−39	21	3
315·07	− 0·43	...	6·5		,,		16	55	40	−37	58	7
315·14	+14·06	5·5	6·1	12	c_1 ,,		16	4	51	−28	6	2
315·24	+20·11	5·4	5·8		,,		15	46	47	−23	37	2
315·26	−15·13	...	5·2		ε Telescopii		18	2	19	−45	58	4
315·33	− 0·26	...	...		Scorpii	$7^m·1$	16	55	48	−37	40	3
315·45	+18·77	5·4	6·1		,,		15	51	23	−24	29	0
315·48	+17·28	5·4	5·7		,,		15	56	6	−25	31	7
315·48	−12·13	...	5·4		,,		17	48	2	−44	19	2
315·50	+14·40	4·7	5·3	13	c_2 ,,		16	4	55	−27	36	8
315·91	+13·03	5·0	5·5		d ,,		16	10	51	−28	18	8
315·98	+16·20	5·8	6·0		,,		16	0	49	−26	0	2

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.			Star.		α 1880. h	m	s	δ °	′
316·14	+11·24	5·4	5·9 *d*			Scorpii		16	17	8	−29	25·3
316·36	+ 4·14	2·2	2·3	26	ϵ	„		16	42	24	−34	4·4
316·47	−17·60	...	3·5		α	Telescopii		18	18	4	−46	1·9
316·88	−18·34	...	5·7		δ_1	„		18	22	52	−45	59·6
317·05	−18·32	...	5·7		δ_2	„		18	23	9	−45	50·3
317·20	−13·27	...	5·6			Coronæ aust.		17	58	9	−43	25·7
317·25	−15·08	...	5·9			„ „		18	7	8	−44	14·4
317·37	+20·09	2·5	2·4	7	δ	Scorpii		15	53	14	−22	16·7
317·62	−21·92	...	5·9			Telescopii		18	43	32	−46	44·1
317·64	+18·45	...	6·2			Scorpii		15	58	57	−23	16·7
317·91	−10·99	...	5·3			„		17	49	16	−41	41·8
318·03	−16·40	...	5·7			Coronæ aust.		18	15	34	−44	10·1
318·30	− 8·53	...	3·3		ι_1	Scorpii		17	39	11	−40	4·7
318·37	+ 3·30	...	6·0	27		„		16	49	22	−33	4·0
318·37	+ 1·89	...	5·5		*k*	„		16	56	56	−33	57·1
318·43	− 5·92	...	4·7		Q	„		17	28	17	−38	32·9
318·51	− 0·97	...	6·1			„		17	8	21	−35	36·0
318·59	− 8·93	...	5·6		ι_2	„		17	41	48	−40	3·0
318·66	+14·62	3·0	3·4	20	σ	„		16	13	54	−25	18·2
318·72	− 7·11	...	2·6		κ	„		17	34	11	−38	58·0
318·90	− 4·23	2·8	3·2	34	*v*	„		17	22	36	−37	11·9
318·95	+10·43	2·9	3·2	23	τ	„		16	28	25	−27	57·9
319·09	−12·93	1·1	1·4	21	α	„	(Antares)	16	22	3	−26	9·8
319·20	−17·40	...	6·1			Coronæ aust.		18	23	16	−43	35·3
319·23	+ 5·18	...	cum.			Scorpii	$6^m·9$	16	47	27	−31	12·2
319·38	− 4·59	1·7	2·0	35	λ	„		17	25	28	−37	0·9
319·40	− 0·92	...	6·1			„		17	10	47	−34	51·2
319·45	−13·00	...	6·2			Coronæ aust.		18	2	35	−41	22·7
319·55	+ 3·60	5·3	5·7			Scorpii		16	54	7	−31	57·8
319·64	+15·68	4·7	5·1	19	*o*	„		16	13	25	−23	52·7
319·66	−13·34	...	5·9			Coronæ aust.		18	4	43	−41	21·7
319·93	+20·17	4·6	4·6	10	ω_2	Scorpii		16	0	22	−20	32·6
319·98	+20·41	4·1	4·4	9	ω_1	„		15	59	47	−20	20·6
319·96	+17·10	var. in cum. Mess 80			T	„ Nova 1860	$7^m·0$	16	9	54	−22	40·7
320·10	−18·55	...	5·8			Coronæ aust.		18	30	58	−43	17·2
320·14	+ 0·50	...	5·8			Scorpii		17	7	27	−33	24·5
320·30	−20·28	...	5·7		η_1	Coronæ aust.		18	40	11	−43	48·5
320·40	+21·24	2·9	2·5 *d*	8	β	Scorpii		15	58	28	−19	28·5

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′
320·44	+13·44	4·6	5·3	22	*i* Scorpii	16	22	55	−24	51·0
320·47	−17·16	...	5·1		θ Coronæ aust.	18	24	56	−42	23·8
320·53	− 6·05	...	6·2		Scorpii	17	34	42	−36	53·0
320·59	−20·31	...	6·0		η_2 Coronæ aust.	18	40	57	−43	33·9
320·99	+15·34	5·3	5·5 *d*	5	ρ Ophiuchi	16	18	23	−23	10·1
321·08	+ 0·73	...	5·9		Scorpii	17	9	15	−32	31·5
321·19	− 7·28	...	3·4		G „	17	41	41	−37	0·2
321·79	−21·19	...	5·8		Coronæ aust.	18	47	44	−42	51·6
321·81	+20·37	4·2	4·3 *d*	14	ν Scorpii	16	5	1	−19	8·8
321·83	+ 3·50	...	6·2		„	17	1	8	−30	14·6
322·84	−15·87	...	5·6		Coronæ aust.	18	24	0	−39	47·1
322·90	−22·17	...	5·2		ζ „ „	18	54	37	−42	15·8
322·93	−13·67	...	5·6		„ „	18	14	2	−38	42·5
323·17	−14·89	...	6·0		„ „	18	20	9	−39	3·9
323·27	− 2·26	...	5·8		Scorpii	17	26	52	−32	29·8
323·40	+17·88	4·6	4·8	4	ψ Ophiuchi	16	17	5	−19	45·3
323·43	−18·85	...	5·5		μ Coronæ aust.	18	39	21	−40	31·9
323·57	+15·52	4·7	4·7	9	ω Ophiuchi	16	25	1	−21	12·5
323·41	− 6·78	...	cum. Mess 7		Scorpii	6m·8	17	45	23	−34	51·8
323·57	− 7·34	...				7 ·5	17	48	7	−35	1·5
323·71	− 6·35	...				7 ·1	17	44	21	−34	23·0
324·12	− 6·78	...				7 ·5	17	47	12	−34	15·8
323·85	−15·64	...	5·4 *d*		κ Coronæ aust.		18	25	7	−38	48·3
323·90	−18·08	...	5·6		„ „		18	36	37	−39	48·3
323·92	− 2·41	...	cum. Mess. 6		Scorpii	7m·2	17	29	10	−32	2·9
324·21	− 2·99	...				6 ·7	17	32	12	−32	7·9
324·31	− 3·17	...				6 ·8	17	33	9	−32	8·9
324·23	−11·98	3·0	3 3		η Sagittarii		18	9	30	−36	47·7
324·63	+ 0·57	4·4	4·6	45	*d* Ophiuchi		17	19	42	−29	45·4
324·80	−12·87	...	6·0		Sagittarii		18	14	45	−36	43·4
324·88	−22·54	...	5·0		δ Coronæ aust.		19	0	0	−40	40·8
324·97	+ 8·32	...	6·1	26	Ophiuchi		16	52	49	−24	48·3
325·12	+18·40	5·0	4·6	7	χ „		16	20	4	−18	10·9
325·12	−17·32	...	5·4		λ Coronæ aust.		18	35	33	−38	26·2
325·25	−12·78	...	6·2		Sagittarii		18	15	23	−36	17·7
325·54	+ 2·27	5·6	5·8	43	Ophiuchi		17	15	49	−28	1·5
325·68	− 4·36	...	5·5		Scorpii, Sagittarii		17	41	23	−31	39·6
325·79	+ 4·62	4·7	4·9 *d*	36	A Ophiuchi		17	7	58	−26	25·5

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880. h	m	s	δ 1880. °	′
325·96	+10·05	5·6	5·9	24 Ophiuchi	16	49	34	−22	57·5
326·14	+22·79	6·0	6·3	Scorpii	16	9	5	−14	32·8
326·17	−22·43	...	4·1	β Coronæ aust.	19	1	46	−39	31·8
326·30	+14·78	5·7	6·0	Ophiuchi, Scorpii	16	34	51	−19	41·6
326·61	−10·72	...	6·5	Sagittarii	18	9	39	−34	8·8
326·75	−20·82	...	6·1	Coronæ aust.	18	55	6	−38	25·5
327·01	−12·05	2·1	2·2	20 ε Sagittarii	18	16	12	−34	26·4
327·13	−19·26	...	5·7	Coronæ aust.	18	48	32	−37	29·7
327·27	+18·85	4·4	4·6	8 φ Ophiuchi	16	24	16	−16	21·0
327·53	−19·55	...	5·5	ε Coronæ aust.	18	50	38	−37	15·7
327·58	−21·82	...	4·2	α „ „	19	1	18	−38	5·4
327·66	+12·36	...	6·1	Ophiuchi	16	46	20	−20	12·8
327·71	−16·31	...	5·2	Sagittarii	18	36	17	−35	45·5
327·76	−19·96	...	6·2 *d*	Coronæ aust.	18	32	57	−37	13·5
327·93	+ 4·32	3·4	3·6	42 θ Ophiuchi	17	14	38	−24	52·7
327·99	+ 5·48	5·2	5·5 *d*	39 *o* „	17	10	42	−24	9·3
328·02	+16·21	5·2	5·5	„ , 24 Scorpii	16	34	38	−17	30·5
328·02	− 5·41	...	5·4	Sagittarii	17	51	23	−30	14·3
328·14	+ 1·81	...	6·2	Ophiuchi	17	24	17	−26	10·6
328·19	−20·95	...	4·6 *d*	γ Coronæ aust.	18	58	18	−37	14·0
328·27	+25·14	...	5·6	17 χ Scorpii	16	7	13	−11	31·8
328·40	+20·79	5·8	6·1	Ophiuchi	16	23	0	−14	17·2
328·64	− 6·74	3·0	2·8	10 γ Sagittarii	17	58	6	−30	25·4
328·77	− 1·99	var.	4 −6	3 X „	17	40	0	−27	47·0
328·82	− 7·70	5·7	5·9 *d*	„	18	2	21	−30	44·8
328·95	−12·69	...	5·8	„	18	23	12	−33	4·0
329·18	+ 4·00	4·5	4·5	44 *b* Ophiuchi	17	19	2	−24	3·8
329·20	−13·24	...	5·6	Sagittarii	18	26	5	−33	6·2
329·27	− 4·56	5·8	6·2	„	17	51	2	−28	44·6
329·27	− 6·17	var.	5 −6·5	W „	17	57	21	−29	35·0
329·64	− 3·83	5·8	6·0	„	17	49	7	−28	2·7
329·99	+22·35	var.	7·0−10	V Ophiuchi	16	20	3	−12	9·2
330·01	+ 3·17	4·9	5·2	51 *c* „	17	24	6	−23	52·1
330·37	−10·52	5·7	6·0	Sagittarii	18	17	19	−30	49·0
330·59	− 6·18	4·7	5·1	„	18	0	29	−28	28·1
330·78	− 9·33	2·8	2·8	19 δ „	18	13	19	−29	52·6
330·99	+ 6·77	4·5	5·1	40 ξ Ophiuchi	17	13	49	−20	59·0
331·40	+16·67	...	6·1	„	16	41	38	−14	41·7

Galactic Long.	Lat.	Magn. H.P.	Magn. U.A.		Star.		α 1830. h	m	s	δ 1830. °	′	″
331·50	−10·61	6·0	6·2		Sagittarii		18	20	9	−29	53	2
331·97	+ 4·71	...	...		Ophiuchi	Nova 1604	17	23	27	−21	22	6
332·92	− 7·40	4·7	5·1		Sagittarii		18	10	33	−27	5	1
333·27	+21·50	2·8	2·6	13 ζ	Ophiuchi		16	30	33	−10	19	4
333·29	+12·23	var.	7·0−?	R	„		17	0	52	−15	55	9
333·44	+ 2·11	5·0	5·4	58	„		17	36	14	−21	37	4
333·60	− 3·05	5·4	5·9	7	Sagittarii		17	55	30	−24	16	8
333·61	+ 8·90	...	6·1		Ophiuchi		17	12	54	−17	37	8
333·63	+24·66	4·6	5·2	3 υ	Ophiuchi		16	21	19	− 8	6	1
333·64	− 2·21	4·6	5·4	4	Sagittarii		17	52	28	−23	48	0
333·65	− 3·29	5·7	6 o cum.	9	„		17	56	31	−24	21	7
333·77	− 3·57	...	6·5 neb.		„		17	57	49	−24	24	2
333·91	−18·25	5·5	5·9		„		18	56	43	−31	13	3
333·97	+11·94	2·6	2·4	35 η	Ophiuchi		17	3	30	−15	34	5
334·50	− 1·89	...	7·1		Sagittarii		17	55	15	−22	54	1
334·77	− 2·09	5·8	6·3		„		17	54	38	−22	46	5
334·76	+15·72	var.	5·5−12		Ophiuchi, Nova 1848		16	52	47	−12	42	4
334·86	−17·42	2·9	3·1	38 ζ	Sagittarii		18	54	58	−30	3	0
335·08	+18·88	4·7	5·1	20	„		16	43	12	−10	34	2
335·13	− 4·50	5·3	5·7		Sagittarii		18	4	24	−23	43	4
335·18	− 7·04	6·6	var.		„		18	14	8	−24	58	0
335·29	− 2·41	...	6·8		„		17	56	57	−22	30	2
335·46	− 8·57	3·1	2·7	22 λ	„		18	20	34	−25	29	2
335·89	−12·80	3·3	3·7	27 φ	„		18	38	10	−27	6	7
336·91	+23·74	6·0	6·4		Ophiuchi		16	31	36	− 6	17	7
337·15	− 4·01	5·9	6·0	14	Sagittarii		18	7	3	−21	44	6
337·33	− 9·09	5·9	5·9	24	„		18	26	34	−24	7	2
337·39	−17·36	3·5	3·6	40 τ	„		18	59	27	−27	50	7
337·51	−14·42	2·3	2·4	34 σ	„		18	47	49	−26	26	6
337·62	−11·75	5·7	6·2		„		18	37	27	−25	7	8
337·66	− 3·59	4·1	4·3	13 μ	„		18	6	35	−21	5	3
337·70	− 9·53	...	neb. Mess 22		„	$6^{m}\cdot1$	18	29	1	−24	0	2
337·86	+11·49	4·4	4·6	53 ν	Serpentis		17	14	5	−12	43	4
337·99	+ 6·69	3·7	3·7	55 ξ	„		17	30	43	−15	19	3
338·12	− 3·71	5·6	5·8	15	Sagittarii		18	8	3	−20	45	7
338·27	+15 03	5·6	5·8		Ophiuchi		17	3	10	−10	21	9
338·30	− 9·78	5 8	6·1		Sagittarii		18	31	13	−23	36	3
338·84	−21·00	5·9	5·9		„		19	17	1	−28	5	8

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.		α 1880. h m s	δ 1880. ° ′ ″
°	°	m	m					
339·46	− 5·68	4·9	5·1	21	Sagittarii		18 18 12	−20 36·3
339·52	+ 0·92	6·1	6·9	6	,,		17 54 25	−17 9·1
339·60	−15·25	5·7	6·1		,,		18 55 7	−25 0·6
339·81	+20·60	5·6	5·8	23	Ophiuchi		16 48 11	− 5 57·4
339·86	+ 5·02	...	6·1		Serpentis		17 40 46	−14 40·7
339·94	− 2·74	...	6·5		Sagittarii		18 8 28	−18 41·8
340·04	+ 2·66	5·9	5·9		Serpentis, Ophiuchi		17 49 25	−15 47·4
340·12	− 8·66	...	6·2		Sagittarii		18 30 43	−21 29·7
340·15	−10·86	5·6	5·6	28	,,		18 39 6	−22 31·0
340·31	− 0·39	5·9	5·9		,,		18 0 51	−17 10·1
340·35	− 3·04	cum. Mess 24			,,	$6^m·9$	18 10 26	−18 30·2
340·36	− 3·37					7 ·2	18 11 40	−18 39·8
340·46	− 4·04	var.			Y ,,		18 14 19	−18 54·7
340·47	−13·20	5·9	6·4		,,		18 48 45	−23 19·5
340·52	−18·11	5·2	5·4	42	ψ ,,		19 8 11	−25 27·7
340·54	− 8·70	6·0	6·0		,,		18 31 44	−21 9·0
340·62	+ 7·27	4·4	4·7	56	*o* Serpentis		17 34 40	−12 48·6
340·67	−12·63	5·0	5·0	32	ν_1 Sagittarii		18 46 55	−22 53·5
340·84	−12·78	5·2	5·1	35	ν_2 ,,		18 47 52	−22 49·2
340·85	−11·68	6·1	6·6	30	,,		18 43 38	−22 17·9
341·13	+ 9·52	6·0	5·8		Serpentis		17 28 6	−11 9·6
341·26	− 2·44	...	6·4		Sagittarii		18 10 13	−17 24·8
341·45	− 6·34	var.	7·0−83		U ,,		18 24 49	−19 12·4
341·61	− 5·79	5·7	6·0		,,		18 23 9	−18 48·2
341·85	+ 8·99	...	6·1		Serpentis		17 31 30	−10 51·2
341·92	−11·96	6·0	6·0	33	Sagittarii		18 46 50	−21 30·3
342·04	− 5·89	5·2	5·5		,,		18 24 24	−18 29·0
342·20	−19·82	5·1	5·4	47	χ_1 ,,		19 17 58	−24 44·4
342·38	−10·59	5·5	5·5	29	,,		18 42 33	−20 27·6
342·49	+20·35	5·0	5·5	30	Ophiuchi		16 54 44	− 4 2·5
342·55	−12·63	3·5	3·5	37	ξ_2 Sagittarii		18 50 34	−21 15·8
342·70	−14·35	3·9	3·8	39	*o* ,,		18 57 29	−21 54·9
342·75	−19·64	5·9	5·6	49	χ_2 ,,		19 18 14	−24 11·8
342·92	−12·34	5·0	5·7	36	ξ_1 ,,		18 50 13	−20 48·7
342·95	− 2·28	5·8	5·8		,,	Serpentis	18 13 14	−15 52·7
342·95	−22·34	4·6	4·7	52	h_2 ,,		19 29 24	−25 8·8
343·05	−22·14	5·8	var.	51	h_1 ,,		19 28 44	−24 58·8

Galactic Long.	Lat.	Magn. H.P.	U.A.	Star.			α 1880. h	m	s	δ 1880. °	′	″
°	°	m	m									
343·76	−17·97	5·7	5·9			Sagittarii	19	13	26	−22	37	4
343·92	−15·10	3·1	3·1	41	π	„	19	2	38	−21	12	8
344·22	+10·55	4·7	4·7	57	μ	Ophiuchi	17	31	19	− 8	2	7
344·53	− 0·94	...	neb. Mess. 16			Serpentis	8m.	18	11	48	−13	50·
344·84	−12·90	5·9	6·4			Sagittarii		18	56	1	−19	25·0
344·94	−18·90	5·5	5·9	50		„		19	19	10	−22	0·8
345·14	− 3·54	4·7	4·8	2	Hev.	Scuti		18	22	21	−14	38·4
345·29	− 4·44	5·8	5·9			„		18	25	52	−14	57·1
345·34	+14·52	4·6	4·5	27	Hev.	Ophiuchi		17	20	16	− 4	58·8
345·36	−14·02	5·5	5·8			Sagittarii		19	1	14	−19	28·6
345·41	− 4·63	5·8	6·4			Scuti		18	26	48	−14	56·5
345·42	+13·15	5·8	5·9			Ophiuchi		17	27	5	− 5	39·3
345·57	+ 5·24	3·5	3·5	64		„		17	52	25	− 9	45·5
345·63	+20·52	6·2	6·6			„		17	0	40	− 1	29·6
345·74	−13·53	...	6·7			Sagittarii		19	0	7	−18	55·6
345·81	− 0·06	cum.	VIII. 15			Serpentis	7m·	18	11	22	−12	17·1
346·13	+21·21	5·6	5·9			Ophiuchi		16	59	21	− 0	43·6
346·34	+20·54	5·9	6·3			„		17	2	2	− 0	55·2
346·61	− 9·99	5·6	5·8			Sagittarii		18	48	36	−16	31·3
346·63	− 1·02	5·9	6·0			Scuti		18	16	29	−12	4·3
346·69	−15·85	4·9	5·6	43	*d*	Sagittarii		19	10	37	−19	9·9
347·45	+ 5·19	4·9	5·3 *d*	69	τ	Ophiuchi		17	56	33	− 8	10·7
347·71	+ 4·47	...	6·2			Serpentis		17	59	35	− 8	19·9
347·76	−16·45	6·1	6·5	45		Sagittarii		19	14	51	−18	31·7
347·80	− 9·46	5·1	5·5			Scuti, Sagittarii		18	47	50	−15	45·1
347·87	+ 8·45	var.	6·2−7·0		Y	Ophiuchi		17	46	13	− 6	6·8
348·02	−12·35	5·8	6·0			Sagittarii		18	59	58	−16	24·7
348·09	+19·09	5·0	5·1	41		Ophiuchi		17	10	27	− 0	18·5
348·17	−16·22	3·9	4·2	44	ρ	Sagittarii		19	14	43	−18	4·3
348·39	−11·82	6·0	5·9			„		18	58	49	−15	50·4
348·69	− 2·17	...	6·1 *d*			Scuti		18	24	46	−10	52·6
348·96	− 3·03	5·3	5·7			„		18	28	22	−11	4·1
349·00	−22·32	5·1	5·2	56	*f*	Sagittarii		19	39	22	−20	2·9
349·36	+ 0·41	5·0	5·3	1	Hev.	Scuti		18	17	5	− 8	59·7
349·41	+15·83	5·4	5·7 *d*			Ophiuchi		17	24	13	− 0	57·7
349·48	+20·11	var.	6·0−6·7		U	„		17	10	26	+ 1	20·7
349·48	−19·68	6·0	5·8			Sagittarii		19	30	6	−18	29·8

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.		Star.	α 1880. h	m	s	δ 1880. °	′	″
349·92	+ 7·64	6·0	6·1		Ophiuchi, Serpentis	17	53	14	− 4	48	5
349·93	− 15·39	4·7	4·9	46	*v* Sagittarii	19	14	51	− 16	10	7
350·20	+ 8·62	5·7	5·8		Ophiuchi, Serpentis	17	50	28	− 4	3	8
350·21	− 9·15	5·3	5·6		Sagittarii	18	52	39	− 13	0	1
350·44	+ 16·87	5·2	5·6		Ophiuchi	17	22	42	+ 0	25	8
350·82	+ 6·25	5·8	6·0		Serpentis	17	59	52	− 4	45	6
351·01	+ 8·03	4·5	4·9	57	ζ „	17	54	9	− 3	40	9
351·11	− 5·13	5·8	6·2		Scuti	18	40	6	− 10	15	1
351·27	− 15·94	5·7	5·9		Sagittarii	19	19	21	− 15	17	4
351·37	− 1·72	4·0	3·6	3 Hev.	Scuti, 1 Aquilæ	18	28	41	− 8	19	6
351·52	− 3·65	4·8	5·1	4 Hev.	„ 2 „	18	35	42	− 9	10	0
351·74	− 19·62	5·6	5·5	54	e_1 Sagittarii	19	33	51	− 16	34	0
352·10	− 19·93	5·0	5·4	55	e_2 „	19	35	39	− 16	24	2
352·24	− 15·24	5·8	5·9		„	19	18	35	− 14	8	0
352·33	− 11·88	5·8	5·8		„	19	6	33	− 12	29	0
352·35	− 3·54	5·1	5·2	5 Hev.	Scuti, 3 Aquilæ	18	36	59	− 8	23	5
352·50	− 19·74	5·5	5·8		Sagittarii	19	36	43	− 15	44	8
352·93	+ 17·54	5·6	5·9		Ophiuchi	17	25	20	+ 2	48	9
353·27	− 18·06	5·6	5·8		Sagittarii	19	30	49	− 14	33	8
353·60	+ 19·29	4·5	4·7	49	*σ* Ophiuchi	17	20	34	+ 4	14	8
354·31	+ 11·11	5·8	6·1		„	17	50	12	+ 0	41	4
354·34	+ 3·90	3·4	3·5	58	*η* Serpentis	18	15	6	− 2	55	7
354·45	− 23·00	5·0	5·3	61	*g* Sagittarii	19	51	9	− 15	48	5
354·53	+ 14·62	5·8	5·9 *d*	61	Ophiuchi	17	38	33	+ 2	39	0
355·05	+ 13·95	3·8	3·8	62	*γ* „	17	41	53	+ 2	45	2
355·02	− 4·22	...	cum.neb.	Mess. 11	Scuti	7m·	18	44	42	− 6	25	1
355·08	− 3·14	var.	4·7 − 9·0	R	„		18	41	5	− 5	49	9
355·56	+ 10·25	4·4	5·1	68	Ophiuchi		17	55	40	+ 1	18	6
355·87	− 2·61	4·4	4·5	6 Hev.	Scuti, 6 Aquilæ		18	40	48	− 4	52	5
356·12	− 5·29	5·1	5·4	7 Hev.	„ „ 9 „		18	50	38	− 6	0	0
356·15	+ 2·56	5·5	5·8	60	*c* Serpentis		18	23	26	− 2	3	7
356·15	− 9·70	5·3	5·9	20	Aquilæ		19	6	10	− 8	8	3
356·16	+ 15·82	2·9	2·8	60	*β* Ophiuchi		17	37	33	+ 4	37	1
356·46	− 15·82	5·3	5·8	37	Aquilæ		19	28	30	− 10	49	3
356·71	− 6·22	4·0	3·8	12	„		18	55	16	− 5	54	4
356·79	+ 21·01	6·0	6·3		Ophiuchi		17	20	31	+ 7	42	1
356·85	+ 11·28	4·0	4·2	67	„		17	54	38	+ 2	56	3

Galactic Long.	Galactic Lat.	Magn. H.P.	Magn. U.A.	Star.	α 1880.	δ 1880.
°	°	m	m		h m s	° ′
357·10	+10·05	4·1	4·2 *d*	70 Ophiuchi	17 59 23	+ 2 31·7
357·67	+15·31	...	cum.	„	7m·1 17 40 48	+ 5 49·5
357·68	+22·13	6·0	6·1	„	17 18 14	+ 8 57·9
357·74	+ 4·16	5·2	5·5 *d*	59 *d* Serpentis	18 21 4	+ 0 7·6
358·09	+12·07	4·8	5·4	66 Ophiuchi	17 54 19	+ 4 22·6
358·09	− 6·82	3·6	3·3	16 λ Aquilæ	18 59 53	− 5 3·7
358·14	−19·32	5·6	5·8	51 „	19 44 11	−11 4·0
358·18	+ 9·37	5·7	6·2	Ophiuchi	18 3 54	+ 3 6·4
358·42	+ 1·65	5·8	6·1	ε Serpentis	18 31 26	− 0 24·5
358·45	+ 9·30	5·7	5·8	Ophiuchi	18 4 41	+ 3 18·1
358·67	− 6·13	5·6	5·6	15 *h* Aquilæ	18 58 37	− 4 12·5
358·71	− 5·52	5·5	5·7	14 *g* „	18 56 35	− 3 52·3
358·78	+14·43	5·9	6·2	Ophiuchi	17 47 24	+ 6 7·6
358·90	+ 9·86	5·7	6·0	73 „	18 3 36	+ 3 58·4
358·97	−12·90	var.	6·3−7·3	U Aquilæ	19 22 54	− 7 17·3
359·11	− 0·60	5·8	6·2 *d*	5 „	18 40 17	− 1 5·2
359·34	−10·20	5·2	5·6	26 *f* „	19 14 8	− 5 38·3
359·58	− 3·18	6·0	6·5	„	18 50 9	− 1 57·2
359·69	+20·15	5·9	5·8	53 *f* Ophiuchi	17 28 55	+ 9 40·1
359·71	−25·97	4·5	4·5	5 α_1 Capricorni	20 11 0	−12 52·7
359·72	−26·07	3·8	3·6	6 α_2 „	20 11 24	−12 54·9
359·75	+ 7·10	5·0	5·5	74 Ophiuchi	18 14 53	+ 3 19·4
359·90	−14·54	4·3	4·6	39 κ Aquilæ	19 30 26	− 7 17·6

Supplementary List.

9·65	−18·15	6·0	6·7	64 Aquilæ	20 1 50	− 1 1·3
11·83	+22·00	5·9	...	Herculis	17 43 16	+20 36·4
13·80	+22·21	5·9	...	„	17 45 45	+22 21·0
18·44	− 5·45	6·1	6·2	48 ψ Aquilæ	19 38 59	+13 0·9
26·29	−16·75	6·1	6·3	8 θ Delphini	20 33 4	+12 53·7
26·82	+22·21	5·9	...	Herculis	18 7 22	+33 25·1
31·12	+14·20	6·0	...	Lyræ	18 50 29	+33 49·0
31·46	+12·76	6·1	...	„	18 57 22	+33 27·0
34·71	+10·08	6·1	...	„	19 16 10	+34 57·7
36·58	+11·43	6·1	...	„	19 14 48	+37 13·5
37·95	+17·65	6·1	...	„	18 48 16	+41 14·3

Galactic Long.	Lat.	Magn. H.F.	Magn. U.A.		Star.	α 1880. h m s	δ 1880. ° ′
°	°	m	m				
44·85	+21·25	6·0	...		Draconis	18 45 6	+48 37·8
47·95	+ 0·21	6·1	...		Cygni	20 35 10	+40 9·3
48·56	+14·68	6·1	...		,,	19 30 23	+49 0·1
49·05	+22·91	5·8	...		Draconis	18 44 2	+52 51·4
49·29	+22·21	5·6	...		,,	18 48 54	+52 49·2
50·67	+ 6·86	6·1	...		Cygni	20 16 7	+46 27·5
68·18	+22·39	5·8	...		Draconis	19 44 28	+69 2·6
73·51	+ 7·50	6·1	...		Cephei	22 8 38	+62 41·9
73·81	+ 6·74	6·2	...	25	,,	22 14 18	+62 12·2
79·36	+22·14	5·8	...		,, 77 Drac.	21 7 52	+77 38·4
81·33	−17·57	6·1	...		Andromedæ	23 55 36	+41 41·9
81·34	−12·50	6·1	...		,,	23 49 30	+46 41·3
81·67	−14·70	6·1	...		,,	23 54 36	+44 35·1
84·24	+11·75	6·2	...		Cephei	23 29 47	+70 58·7
85·03	+ 2·01	6·1	...		Cassiopeiæ	23 58 4	+61 37·2
87·92	− 0·60	6·0	...		,,	0 23 39	+59 19·9
95·33	+22·37	6·0	...		Cephei	2 53 13	+81 0·2
97·50	−16·61	6·1	...		Andromedæ	1 19 16	+42 50·1
100·26	−22·46	5·9	...		,,	1 27 21	+36 37·3
105·34	+21·65	6·0	...		Camelopardi	4 49 33	+73 53·2
106·61	+22·07	5·7	...		,,	5 3 26	+73 7·6
116·15	+23·28	5·3	...	36	,,	6 0 47	+65 44·4
119·76	+ 9·34	6·2	...		,,	4 38 17	+55 23·2
120·64	+22·34	5·4	...	1	Lyncis	6 6 51	+61 33·1
124·20	+22·31	5·5	...	5	,,	6 16 20	+58 28·8
126·32	+21·49	5·4	...		,,	6 16 8	+56 20·8
138·20	+22·47	5·9	...		Aurigæ	6 47 40	+46 25·5
162·88	−22·89	5·7	6·0	5	Orionis	4 47 7	+ 2 18·5
166·51	−17·42	5·4	5·9	21	,,	5 12 56	+ 2 28·2

The following are the galactic longitudes of the points at which the equator, the ecliptic and the parallels + 30° and − 30° of declination cross the parallels of galactic latitude :

Gal. Lat.	Equat.	Decl. +30°		Eclipt.	Equat.	Decl. −30°		Eclipt.	Gal. Lat.
+26°	343°·64	21°·15	158°·85	169°·92	196°·36	247°·50	292°·50	315°·51	+26°
24	345·10	22·02	157·98	168·38	194·90	242·75	297·25	317·05	24
22	346·51	22·92	157·08	166·90	193·49	238·86	301·14	318·53	22
20	347·87	23·85	156·15	165·47	192·13	235·54	304·46	319·96	20
18	349·19	24·80	155·20	164·08	190·81	232·62	307·38	321·35	18
16	350·47	25·79	154·21	162·73	189·53	230·00	310·00	322·70	16
14	351·72	26·81	153·19	161·41	188·28	227·64	312·36	324·02	14
12	352·95	27·87	152·13	160·12	187·05	225·48	314·52	325·31	12
10	354·16	28·98	151·02	158·85	185·84	223·48	316·52	326·58	10
8	355·35	30·12	149·88	157·60	184·65	221·62	318·38	327·82	8
6	356·52	31·32	148·68	156·37	183·48	219·88	320·12	329·06	6
4	357·69	32·57	147·43	155·14	182·31	218·25	321·75	330·28	4
+ 2	358·84	33·89	146·11	153·93	181·16	216·72	323·28	331·50	+ 2
0	0·00	35·26	144·74	152·71	180·00	215·26	324·74	332·71	0
− 2	1·16	36·72	143·28	151·50	178·84	213·89	326·11	333·93	− 2
4	2·31	38·25	141·75	150·28	177·69	212·57	327·43	335·14	4
6	3·48	39·88	140·12	149·06	176·52	211·32	328·68	336·37	6
8	4·65	41·62	138·38	147·82	175·35	210·12	329·88	337·60	8
10	5·84	43·48	136·52	146·58	174·16	208·98	331·02	338·85	10
12	7·05	45·48	134·52	145·31	172·95	207·87	332·13	340·12	12
14	8·28	47·64	132·36	144·02	171·72	206·81	333·19	341·41	14
16	9·53	50·00	130·00	142·70	170·47	205·79	334·21	342·73	16
18	10·81	52·62	127·38	141·35	169·19	204·80	335·20	344·08	18
20	12·13	55·54	124·46	139·96	167·87	203·85	336·15	345·47	20
22	13·49	58·86	121·14	138·53	166·51	202·92	337·08	346·90	22
24	14·90	62·75	117·25	137·05	165·10	202·02	337·98	348·38	24
−26	16·30	67·50	112·50	135·51	163·64	201·15	338·85	349·92	−26

Gould's investigation places the pole of the galactic circle in α 12^h 41^m 20^s δ +27° 21′ for 1875 (Uran. Arg. p. 371) and that of the belt of bright stars in α 11^h 25^m δ + 30° (p. 356), the medial line of the belt being 92°·3 from the pole (p. 362). The following are the galactic latitudes of the points at which the longitude-circles of the adopted system are crossed by Gould's galactic great circle, by its + 20° and — 20° parallels, and by the great circle and the medial line of the belt of stars :

Gal. Long.	Gould's Galactic Circle.			Belt.	
	+20°	0°	−20°	0°	−2°·8
°	°	°	°	°	°
0	+19·67	−0·35	−20·37	+16·1	+13·3
10	20·14	+0·12	19·90	15·7	12·9
20	20·61	0·59	19·44	14·8	11·9
30	21·06	1·04	18·98	13·4	10·6
40	21·47	1·45	18·56	11·7	8·8
50	21·84	1·83	18·19	9·5	6·7
60	22·15	2·14	17·87	7·1	4·2
70	22·40	2·40	17·61	4·4	+ 1·5
80	22·58	2·58	17·43	+ 1·6	− 1·4
90	22·68	2·68	17·32	− 1·3	− 4·2
100	22·70	2·70	17·30	4·2	7·1
110	22·64	2·64	17·37	6·9	9·8
120	22·50	2·49	17·51	9·3	12·2
130	22·28	2·28	17·73	11·5	14·4
140	22·00	1·99	18·02	13·3	16·1
150	21·66	1·64	18·37	14·7	17·5
160	21·27	1·25	18·77	15·6	18·4
170	20·83	0·81	19·21	16·1	18·9
180	+20·37	+0·35	−19·67	−16·1	−18·9
190	19·90	−0·12	20·14	15·7	18·5
200	19·44	0·59	20·61	14·8	17·6
210	18·98	1·04	21·06	13·4	16·3
220	18·56	1·45	21·47	11·7	14·5
230	18·19	1·83	21·84	9·5	12·3
240	17·87	2·14	22·15	7·1	10·0
250	17·61	2·40	22·40	4·4	7·3
260	17·43	2·58	22·58	− 1·6	− 4·5
270	17·32	2·68	22·68	+ 1·3	− 1·6
280	17·30	2·70	22·70	4·2	+ 1·3
290	17·37	2·64	22·64	6·9	4·0
300	17·51	2·49	22·50	9·3	6·5
310	17·73	2·28	22·28	11·5	8·6
320	18·02	1·99	22·00	13·3	10·5
330	18·37	1·64	21·66	14·7	11·9
340	18·77	1·25	21·27	15·6	12·8
350	19·21	0·81	20·83	16·1	13·3
0	+19·67	−0·35	−20·37	+16·1	+13·3

The preparation of the catalogue of galactic positions has already consumed so much time, on account of its repeated extensions and the consequent rearrangements and transpositions, that at present I cannot spare the additional time required for a final independent re-examination of all the data, so that I must beg of those who make use of the catalogue to be good enough to communicate any errors or discrepancies which they may find. Mr. Ant. Pannekoch, of Leiden, has already done so by kindly sending me a list of errors, which the laying down of the published galactic positions and the comparison with the usual star maps had led him to remark and to examine. A portion of these errors and some additional ones I had already found, so that the following "List of Corrections" may perhaps not be very defective:

Page 78	2·56+3·85 delete.	The correct galactic position of 60 Serpentis is 356·15+2·56 and will be found in its place.
79	13·55−19·14 lat. should be	+19·14.
	13·86−1·16 ω Aquilæ, not α.	
	14·76−11·35 lat. should be	−1·15.
	15·70+16·07 should be	16·68+15·07.
80	18·49+15·64 ,,	19·34+14·00.
81	24·27+18·36 ,,	24·52+18·02.
	24·52+17·72 lat. should be	−17·72.
82	28·30+20·48 ,, ,,	−20·48.
83	31·25+15·12 ,, ,,	−15·12.
90	71·91−15·57 ,, ,,	+15·57.
91	78·30−16·30 ,, ,,	+16·30.
98	117·87−10·61 long. should be	127·87, so that the position should be inserted on the next page.
100	135·10−21·91 lat. should be	+21·91.
104	157·17−3·55 long. ,,	153·17.
105	158·23+2·47 delete.	The correct position of 21 Orionis is found at the end of the supplementary list.
106	162·95−20·97 insert H. P. Mag. 6·0.	
108	173·87−18·99 lat. should be	+18·99.

Colonel Cooper's Observatory,
Markree, Collooney, Ireland.

Erratum in Mr. Prince's paper, vol. liii. p. 342, fourth line from bottom, *for* $8^m\ 30^s$ *read* $8'\ 30''$.

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